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TRANSACTIONS

OF THE

MEDICAL AND PHYSICAL SOCIETY

OF

BOMBAY.

VOLUME I.

American Mission Press. 1838.

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MEDICAL AND PHYSICAL SOCIETY

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VOLUME I.

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BOMBAY:
PRINTED AT THE AMERICAN MISSION PRESS.

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PREFACE.

The proceedings connected with the establishment of the Medical and Physical Society of Bombay, sufficiently explain its objects, and render it unnecessary to recapitulate, here.*

The liberal encouragement with which Government, and the Medical Board have favoured the operations of the Society ; the free access which has been accorded to official records, and the zealous co-operation of individual members, enabled the Committee at an early period, to commence the present volume, though unavoidable delay has attended its progress. Its completion however, may be looked upon as a satisfactory indication, that the objects of the Society are in a fair train of being realized, and that the medical resources which this Presidency affords, only require to be cultivated, in order to yield an ample harvest.

Constituting a body of inquirers, not too

* Vide Appendix.

large to associate and command for the results of research—that force, and conclusiveness, which combination, and uniformity of system, are alone equal to confer; we enjoy an opportunity of observing disease, in much variety of circumstances—in Europeans from infancy to middle age—the newly arrived, the long resident—the temperate, the intemperate—the exposed to, and the protected from injurious influences—the habituated to one climate, or to many: all the variety of native population, with their different pursuits, habits, and modes of life in regard to food, clothing, and habitation. This too, in a tract of country presenting much diversity of climate, and season—the result of difference of latitude, elevation, proximity to the sea, and the absence, or presence of those more local agencies, considered to affect the animal system.

Influenced by such reflections, and impressed with the importance of the particular subject, the Committee at an early period of the Society's operations, ventured to recommend for general adoption, a plan of making, and registering meteorological observations. Though this suggestion of the Committee, has been reprinted in the appendix, it is hardly necessary to remark, that it does not aim to enlarge the bounds of the *science* itself, but merely to

propose a system, level to the resources of all, and calculated to convey trust-worthy knowledge of the more marked qualities of climate, in relation to the causes, and phenomena of disease.

Among other branches of research, which in an especial manner, require the attention of the medical observer between the tropics—may be instanced, the application of the facts ascertained by the experiments of MILNE EDWARDS *on the influence of physical agents on life*, to the explanation of the phenomena of disease.

The facts to which allusion is principally intended, are

1. The greater capacity possessed by warm blooded animals, of generating heat in a cold, than in a warm climate, or season.

2. This change from great to small capacity of generating animal heat, is not sudden, but gradual, and consequently, circumstances may frequently arise, in which, the capacity will not be in relation to the necessity.

3. The capacity of generating animal heat, is in relation to the quantity of oxygen consumed, during respiration.

4. The amount of oxygen consumed, is also influenced by conditions of the animal, in regard to diet, wakefulness, sleep, &c.

5. This relation of certain conditions of the animal, to the consumption of oxygen—establishes a relation between those same conditions, and the capacity of generating animal heat.

To enter into the detail which these facts naturally suggest, would be misplaced here: it is sufficient to call attention to the importance of their consideration, when directing change of climate: for it may with propriety be said, that this important instrument in the prevention, and cure of disease, though daily recommended, and had recourse to, is one, regarding which, we have not definite, or applicable information. Nor can it be advanced, that this state of ignorance on our part, is a necessary result of the abstruseness of the subject; till we shall have studied it, in strict relation to the present condition of meteorological science, and to that additional knowledge of the laws of life, which the experiments of Milne Edwards, have placed at our command.

It may be urged, that medical writers in colder latitudes, have written much, and well, on the subject of change of climate. But without entering into any consideration of the merits of these works, it may at once be presumed, that if, they are applicable to the con-

ditions of *colder latitudes*, they cannot be so in any extent, to countries between the *tropics*.

Change from a cold climate, has always reference to recourse to a warmer one, and has an antiphlogistic tendency: whereas change from a tropical climate, has always reference to recourse to a colder one, and has a tonic tendency: *it is the difference between antiphlogistic regimen and the exhibition of tonics.*

In regard to the 3d, 4th, and 5th facts, it may be remarked, that if we regard the degree of oxygenation of the blood, as not confined in its influence, to the function of animal heat—but as extending to all functions, to the actions of which, the circulation of the blood is essential: then, to a very casual reflection, the wide range of their application will at once, be apparent.

The manner of rearing the children of Europeans in India, and the question of its propriety, are also intimately associated with these physiological facts, and may be thus expressed.

1. By the modification of the action of what functions, are the characteristics of different periods of life, and different varieties of the human race, brought about?

2. Is it rational to suppose, that a knowledge of the laws of these modifications, may lead to a knowledge of the means, by which,

their operation may be counteracted, when unfavourable, or invited when the reverse ?

These propositions tend to a course of inquiry, as yet unentered upon, but of great importance, and falling within the province of the medical practitioner in India, in an especial manner, to attempt.

It has been observed, that the appearance of the *vaccine vesicle* has on different occasions, presented peculiar characters in this country. The ascertainment of the tendency of these modifications, must ultimately constitute an important part, in the history of vaccination.

1. What are the modifications of appearance, which have been observed, and what their laws ?

2. Does the history of small-pox in this country, show, that different epidemics have differences of character, in any respect analogous, to the observed differences in the vaccine disease ?

3. If it be admitted that small-pox in any of its forms, is equally a protection against recurrence, may the same *latitude* of power, not be accorded to the modified forms of the vaccine disease ?

Such are some of the queries which a cur-

sory consideration of this subject, would seem to suggest.

To state, that *the principles which should direct the use of mercury in the treatment of tropical disease* constitute a subject of inquiry, demanding strict investigation—may seem a doubtful position: still, the statement may be very safely hazarded, that, though the power of the remedy, is very generally admitted—though it has been long, and abundantly used in the treatment of tropical disease—the want of knowledge of the facts essential, to its *rational exhibition*, is a blot on the present state of the science. In attempting to remove this, it would be necessary, to enter into a thorough review of the present state of medical opinion, relative to the importance of an *altered condition of the blood*, as an element in the pathology both of cachectic and *inflammatory* diseases, and of the power of mercury to cause, or to prevent, such *altered conditions*.

To all who are convinced, that there is true foundation, for this departure from the doctrine of absolute solidism—it must at once be evident, that *the rules which at present guide the application of mercury in the treatment of tropical disease, are not level to the present state of pathology*. Further, when we look to the more *local* action of mercury, and ad-

mit, that it does possess the power of stimulating the liver, to a more abundant secretion of bile—perhaps the extent of our information, has been stated. But if it be asked, when and for what objects, is it necessary to stimulate the liver to this increased secretion---when in relation to a necessity of guarding against abdominal venous congestions—when, in relation to the bile as an *excretion*—when, in its relation to efficient chylification; there is reason to think that the replies would not be found level, to the present state of *physiology*.

It may be urged, that to attempt, to acquire a knowledge of the laws of disease, by in the first instance, studying the laws of external agencies, and in the second, their manner of operation on the animal system—would be, to revert to the direction of research, followed by the FATHERS of our art, and neglected since the days of SYDENHAM and HUXHAM. It may be further objected, that this order of procedure, would be to desert that mode of inquiry of the modern schools—which seems to be, in a fair way of leading, to a juster knowledge of the laws of disease—which has reference to a knowledge of the ultimate phenomena of disease, (*morbid anatomy*) acquired in the hope of ascending, by gradations of ge-

neralization, to a knowledge of their initiatory laws.

That both are legitimate modes of inquiry, cannot be questioned. The mistake, perhaps, has been, in advocating the one, to the exclusion of the other, instead of allowing the circumstances of the inquirer, to dictate the preference. Where there is much variety in the phenomena of external agencies—of climate, season, modes of life, &c. as in India, then, to study the laws of these phenomena, in relation to their effects, (the production of disease,") ought to occupy much attention. But when these external agencies are less operative, better understood, and guarded against, then, the mode of inquiry, from ultimate *individual* phenomena, to the higher stages of generalization, is that, which more naturally suggests itself.

If there be reason in nature for this distinction, it admits a preponderance to the importance of the study of morbid anatomy, in temperate climates ; but does not make the same admission, in regard to the study of the phenomena of disease, between the tropics. The acknowledgment of such a principle, is of this further consequence, that it at once establishes the conviction, that, *to be slavish imitators of the doctrines, and systems of the European*

schools, is to shew, that we do not estimate our position here, at its true value to science.

To revert again to these two manners of inquiry.

In arguing, the probability of failure on our part, from the want of success of SYDENHAM, and HUXHAM, it ought to be recollected—that HUXHAM did not know, the chemical constitution of the atmospheric air, and that since his time, important additions have been made, to our knowledge of the laws of life. To throw the lights derivable from the science of meteorology, and the experiments of MILNE EDWARDS, on this mode of inquiry, would be, entirely to alter its complexion. Whilst, without wishing to take from the value, of the study of *morbid anatomy*, it may be with reason suspected, that its importance is not always accurately measured—that it is too often considered, as the *end*, instead of the *means*.

It is perhaps occasionally forgotten, that the facts of *morbid anatomy*, are but a part of a series of phenomena—the knowledge of the whole of which, it is hoped, may in time lead, to a knowledge of the general laws of disease. Should a knowledge of these laws, ever teach a more efficient system of prevention and cure of disease—then it will be unnecessary, for the *future* medical philosopher, to go over the

stages of observation by which, this knowledge has been reached: he may not in fact, enjoy the opportunity, because, if the object of studying the appearances of morbid anatomy, be, to lead to a better system of cure—then it follows, that if this object ever be gained, in any considerable degree, *the effect will be, to prevent the recurrence of those very appearances, which now constitute a department of study, under the name of morbid anatomy.*

The present position of the chemist, is in many respects analogous, to what may be that, of the follower of medical science, at some future time. The chemist does not consider it necessary to repeat the experiments of his predecessors, that he may acknowledge the general laws to which these experiments have led: there is this great difference however, in the nature of the objects of study. The laws which the chemist has to determine, concern phenomena which admit of modification by experiment, and are consequently ascertainable, in a short space of time: whereas, the laws which constitute the study of the medical inquirer—regard phenomena, the modifications of which, must to a great degree, be *waited* for, but which can seldom, be forced. It is this, which will cause the process of observation, to extend through centuries, and over different lands,

and which will render a full knowledge of the general laws of disease, probably a very distant event.

Under these circumstances, all that is left for the medical philosopher, is to set limits to his ambition: not to struggle to force the result of his labours, into the false position of a whole, but to rest satisfied with the humbler lot of being a labourer in a field, where many must *yet* toil, before the fruit shall appear in abundance.

Such are some of the reflections which naturally suggest themselves, to a consideration of the circumstances, connected with the medical service in this country. It remains however, that a few remarks be offered, on what ought to constitute the highest aim of its ambition—***The giving of the permanent benefits of medical science to the people of India, by introducing an efficient system of medical education.***

At an early period of the society's operations, Government directed the attention of the committee to this important object, and requested the recorded expression of their opinion. A report was in due course framed, and transmitted to Government, which at some future period, it will be the duty of the committee, to lay before the society.

This report chiefly embraced a considera-

tion, of the fitness of natives to receive medical instruction, and the possibility of commanding the means of conveying it. The inquiry however, is intimately associated with that, of the general education of natives, and had it fallen within the province of the committee, to take an extended grasp of the question: it would not have been difficult to shew, that of pursuits, to the followers of which, learning is an *essential constituent* and not a *mere accomplishment*—the medical profession is the only one of which, an early footing in this country, may be anticipated.

There is another question, which from its being of a strictly professional nature, was left unconsidered in the committee's report, but which it may be well, shortly to allude to, now. ***Is the practical part of medical science, in a condition to be taught to the natives of this country: has full measure of importance been given, to the circumstances of those, amongst whom, it is to be practised: circumstances which must require a special modification of the principles of practice?***

A little reflection on this proposition, in connection with the remarks hazarded in a former part of this introduction, ought to lead to the admission, that as yet, the practice of medicine has to be *studied* in relation to these modifica-

tion. This want, moreover, must be removed, before it can be truly said, that medical science given to the people of this country, will confer the power of removing disease, and alleviating suffering—to the extent derivable, from the correctly modified application of its facts, and principles.

It is not pretended, that there is any difficulty in *repeating* to the native student, the *facts* of *anatomy, chemistry, materia medica, or the principles of the practice of medicine,* as taught in the European schools. This is a task sufficiently simple but let its success be unbounded, as its most sanguine advocates could desire, still it may be contended that much more is requircd, before the gift of medical science to the people of this country, be raised to its full value.

These views, if just, *do not tend to sanction delay,* but to urge the necessity of study, on the part of the medical teacher—and further to shew, that there is not scope merely, for the operations of successful *imitation,* but also for the adaptations of original genius.

In regard to the contents of the volume it is necessary to observe—of the three reports on a disease which prevailed more or less, in Kattywar, Kutch, and part of Guzerat, from the

year 1815 to 1820: that they were presented to the society by Government, at a time when, a similar disease had appeared at Pallee, and was spreading in some of the towns in the north western provinces. This circumstance gives an importance to these reports, and renders their publication now, a useful contribution to science. To discuss them, however, with reference to the disease at Pallee, or the *plague* of the Levant, would be misplaced: it may be apprehended, however, that the subject of plague is too frequently entered upon, in forgetfulness, that medical literature is already enriched with *one hundred and seventy* treatises on the subject.

C. Morehead,
Secretary.

Bombay, January, 1838.

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MEDICAL AND PHYSICAL SOCIETY

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A MAP of part of GOOJERAT

Towns written thus Surat mark the Situations of the Travellers bungalow

- Great Road
- Horse Artillery
- Foot Do
- Cavalry
- Infantry
- Provincial corps.

W.S. Terry. Lieut. Artillery Decr. 1836.

A

GENERAL SKETCH

OF

THE PROVINCE OF GUZERAT

FROM

DEESA TO DAMAUN.

BY A. GIBSON, ESQ.

Presented August 28th, 1836.

THE country which I propose to describe, with a view to its medical topography, comprises Guzerat proper, the Attaveesy or country from the Taptee river to Daman Gunga, and the southern corner of Marwar, being that comprised between the river Suruswutee, and Bunass; in which is the Bombay frontier station of Deesa. I regret that it is not in my power, to complete the description of this the northern grand division of the Bombay territory, by adding an account of Kattiawar, and of Cutch, a task which will doubtless be fulfilled by some one who can do so from personal knowledge.

A part of the district about to be sketched belongs, as I have already said, to Marwar, but as this part contains an important frontier station, the country surrounding which, is under the political control of the

Bombay authorities, I deem it best, to include it, in the general description.

It may be said, that a general sketch of a tract of country so extensive, can be of little use, as minute information regarding the medical topography of its various subdivisions, is required. To this I answer, that a general sketch, need by no means supersede, the more minute accounts of particular districts, which the various medical officers stationed throughout the country, may probably furnish; nay, it may rather be found useful in enabling a reader to understand, and generalize the facts, and information, contained in these reports. What I do describe, I take generally, from personal observations, as, in the course of my professional duties, I have spent more or less time, in most of the districts noted.

I take then, as the North Western boundary, the Bunass river, which, arising in North Western Marwar, holds a S. W. course passing by Deesa, and receiving but few tributary streams, until it loses itself in the Run. From the mouth of this river, a line drawn along the edge of the Run, leads us through the Western part of the Veerungam pergunnah, and intersecting, the small neck of lowlying country which here bounds Kattiawar, brings us to the mouth of the Sauburmuttee, at the head of the gulf of Cambay. We have now this Gulf, and afterwards the Indian ocean, as far as Daman, for the Western boundary; a line drawn from Daman to Durrumpore, gives us the Southern; the Eastern, and North Eastern are formed, by a succession of hilly ranges, stretching (with interruptions of three great alluvial valleys) along the whole of this side of Guzerat, until they are lost in the hills of the Aboo range.

Let me take a more particular view of this hilly range, as on it, and on the rivers which arise from it, the character of many of the districts, as to soil, salubrity, &c. will be found to depend.

Beginning then at the Southern limit of the division; here we find that many hills, offsets from the Western side of the great Western Ghats, and subjacent to them, approach, almost close to the sea. Just above Daman to the North, and still further on, in the same direction, are the isolated hills of Parnera, Rola, and sundry others, in the Chickly, and Mhowa pergunnahs; not in continuous belts, but rather, in isolated mounts, varying in height from 200 to 500 feet. These mounts are (as already observed) offsets, from the ranges of hills, now to be described. These ranges take a course N. E. from the Daman river, and afterwards N. W; they do not, in any instance, exceed 1000, or 1200 feet, in height. From Bansda valley, retiring considerably to the N. E. they decline, from Soneghur to the valley of the Taptee, above Nunderbar, leaving a wide, and funnel-shaped opening, for the passage of the Taptee.

Having crossed the Taptee, we find a great range of hills, running from West, to East; the Westerly end of this range, forms the Eastern boundary of the province between the Taptee and Nerbudda. The hills are lower and more scattered than in the main range, and none appears to exceed 1000 feet; they approach within 30 miles of the sea, in the Turkeswar pergunnah, and the Wusravee district, and here, take the name of the Wusravee and Rajpeepla range; they stretch on to the Nerbudda, and appear to end below Ruttunpore, the seat of the cornelian mines; on this side, the valley of

the Nerbudda, is comparatively narrow. Crossing that river in a line with Nandode, we find the alluvial valley extending for 12 miles, and we are then met by the low hills of the Barria range. These are at first scattered, rather than continuous, and hence afford an easy passage, to the interior of India; and accordingly here is one great road from the coast to Malwa. In front of these low hills, and in a great measure, isolated from them, stands the hill of Powanghur, in height 2000 feet, and seeming like a great Ærolite, dropped, from the clouds into the plain. Following the Barria range, Northward in a plain country, we reach Lunawara, situated on the Myhee, which is here much broken, and divided into streams, for a part of the year.

Crossing the Myhee at Lunawara, we proceed about N. W; having as a boundary, the Damode and Doongurpore hills by Veerpore, Tintue, Eder, and Pahlumpore, behind which latter, the hills lose themselves in the Aboo range, which in its turn declines on the Bunass, and the sandy levels of the N. West.

Between Eder and Kheyruloo, these hills send out a shoot, which divides the small valley of the river Sauburmuttee from that, of the Suruswuttee river.

Let us now cast our eye, on the various rivers of the province, most of which, have their origin in this hilly boundary, while the three largest, the Taptee, Nerbudda, and Myhee, flow through it.

From the number, height, and comparative proximity of the hills, to the southward of the Taptee, we might "a priori" suppose, that the supply of water, in that district, would be abundant: and such is actually the case,

as we find in a breath of 50 miles, eight rivers, all containing water, throughout the year.

Reasoning from these facts, we may also predicate the sort of country, in which these rivers have their origin, viz. under-lying hilly tracts, abounding in rich soil, highly retentive of moisture, and rendered still more so, by luxuriant jungle; but of this more hereafter. I mention it now merely, in order to shew, the necessity of attention, to the sources, and courses of the rivers, when judging, of the agricultural capabilities, salubrity, &c. of any given district. To return.

These rivers of the Attaveesy, all run, from nearly due East, to West; they have little depth (above the tide way), never more, than four feet, when the stream is regular: their fall is slight, their banks, extensively cut by ravines, and water courses, but by no means deeply so. The beds of several are rocky to within fifteen miles of the sea; they are influenced by the tide, ten miles from their mouth, and in none of them, does this influence extend higher.

Beyond these rivers of the Attaveesy, is the great river Taptee, which, taking its rise in the centre of India, and receiving before it leaves the hilly country of Berar, and Kandesh, many tributary streams, does not number three tributaries, after entering the province of Guzerat.

Its bed is sometimes sandy, and sometimes very rocky, with an occasional admixture of black alluvion, as far down as Kurrode, which is distant from its mouth, thirty-two miles. In its lower course, till it reach the sea, its bed consists of mud, and sand. At its mouth a formation of stone of a tertiary kind, appears to be going on, and is highly worthy the observation of the Geologist.

The breadth of the Taptee at Surat is about 1200 feet; below the town, it widens, and has many mud banks, and backwaters, the latter filled only by high spring tides, or in the freshes of the rainy monsoon.

At a distance of seventeen miles, and medial between the Taptee, and Nerbudda, the next River is met with. I allude to that one, which rising in the Rapeepla hills, passes near the Chokie of Kim, and falls into the Gulf of Cambay, at the boundary between the pergunnahs of Olpar, and Hansot.

The next is the great river Nerbudda; which exercises a most important influence, over an extensive tract of country, and in its long course, deposits in Guzerat, much of the rich soil of Central India. In its lower course, it is crossed by belts of rock, at the same distance from the sea, as is the Taptee; it rapidly widdens however, and is consequently more obstructed by shallows, and mud banks, than the latter, and the rocky belts become speedily lost, in the immense alluvial mass. The banks are in many parts, raviney, and precipitous, especially about the town of Broach. Five miles below that city, the high precipitous banks disappear, and the river becomes a broad estuary, studded with islets, and mud banks, and having many side channels, filled during the high spring tides, and the rainy freshes.

The next river is the Dadur, distant twenty-two miles, in a direct northerly line, from the Nerbudda. It is comparatively a small stream which, in its origin the Vishnamuntree, arises below Powanghur, and disembogues itself in a deep clayey estuary, in which is situated the Bunder of Tunkaree.

The next river is the Myhee, a considerable river, hav-

ing its origin far beyond Guzerat. The banks of this river are deeply cut by ravines, extending in every direction; but these ravines seem generally, to be too scantily furnished with vegetable products, to admit of their exerting, any deliterious effect, on the natives who dwell among, or near them; their effect, on the health of Europeans, or strangers has been found, to be more considerable. As we ascend towards the forks of the Myhee, the ravines are more filled with vegetation, and are proportionally less healthy. In the Myhee, the tides are felt at a distance of thirty miles from its mouth. In the rainy season, and during the high spring tides, it forms, within ten miles of its mouth, a magnificent channel of six miles in breath; the bed afterwards, becomes speedily two-thirds dry, and in every part incrusted with salt; but no untoward effect appears to be experienced, by the people of the surrounding country, while this drying process is in progress.

Leaving the Myhee, we pass eighteen miles North, before we arrive at the Seree river, a tortuous, sluggish, sedgy, and deep stream, which runs past Kaira. Just below Kaira, it falls into the united streams, Meshwa and Watruck: both of which have their rise in the Damode, and the Kupperwunje range of hills, and their united stream joins the Sauburmuttee. Passing northward ten miles, we arrive at the Karee river, a small, but rather rapid stream, which also joins the Sauburmuttee; and at a farther distance of twelve miles North, we arrive at the Sauburmuttee, a broad, and generally rather rapid flowing river, which arises from the hills of Mewar, and the Deybur lake; and being joined by the Hautmuttee, high up in its course, and afterwards, by

the four rivers before noticed, falls into the sea at the head of the Gulf of Cambay. So that this portion of Guzerat has, within a space of forty-three miles, viz. from the Myhee to Sauburmuttee, five rivers, and may therefore be supposed to abound in water, as is actually the case. As this district has no hills, excepting on its boundary, it follows that these rivers must have their beds, deep in the soil, otherwise they would, at an earlier part of their course, join each other. Passing North from the Sauburmuttee, we have, in a space of one hundred, and ten miles, only three rivers, viz. the Roopeyn which flows past Mussana, a small river; the Suruswuttee, and Bunass. None of these rivers are of any great size. As the origin of the two first is not remote, and their fall is trifling, they deposit very little alluvion; and accordly we find this tract of country more sandy, and less broken by ravines, than any we have yet described: and the water found on digging, is deep below the surface, though when reached, very pure.

Bearing in mind the foregoing remarks on rivers and streams, we shall be prepared to enter on the consideration of the next head, viz. *soil.*

To the South of Bulsar where the hills approach nearest to the coast, there is much reddish and yellowish soil, formed from the disintegrated lateritious rock. The black soil is less common, and chiefly confined to within five miles of the sea. There is also a good deal of rocky, barren land, producing only grass, and shrubs. The reddish soil is extremely favourable for the growth of both herbs, and trees. In the Durrumpore district, this is particularly the case. Beyond the Western limit of this territory, the soil passes into the black allu-

vion, extending widely from the banks of the rivers, and having here, and there, dry uplands of scanty yellowish soil, interspersed. As we approach nearer, and nearer to the sea, those more barren strips disappear, and merge into one extent of the black alluvial soil. Passing towards the Chicklee pergunnah, we have much of the dry soil with trap, lateritious, and amygdaloid rock, at a very short distance below the surface, and extensive tracts of barren, grassy plain. But at the back or eastern part of the pergunnah, there is an extensive belt of rich, black soil which must be familiar to such of my readers, as have passed down the Roura Ghat (travelling northward) in moist weather, with heavy baggage. This belt is a prolongation of the rich black soil of the Bansda district. The Mowa pergunnah is comparatively stony, and particularly undulating, and the river of Gundavee which passes through this pergunnah (and has its rise at a short distance in the eastern hills) is banked throughout, with a bed of the richest brown soil verging to black, and most favourable for garden produce of every kind. Accordingly the greater part of the Gundavee district, and much of the Soopa pergunnah, which lies on the opposite side of the same river, may be safely said, to be about the most productive of any in the Bombay Presidency.

Down from this, within six miles of the sea, the soil is clayey and salt.

In the Bulsar pergunnah, the black soil is the most common.

Of the Soopa pergunnah, a considerable part is wavy, dry ground, producing only grass, and the date tree in abundance. All the lower levels in the northern parts of

the pergunnah, are black, and (as before mentioned) the southern portion is the more fertile.

In the Surbhon pergunnah, the varieties are much the same, as in that of Soopa. The Walor pergunnah, and the Boharee district, have a rich soil varying from black to dark brown, according to the greater, or lesser level; and I believe that the same soil prevails throughout the whole of this mountainous, jungly tract, inland. There the alluvial soil extends much deeper than in the southern parts of the Attaveesy, and as we approach the Taptee, the black soil greatly predominates.

In the whole of this district, tanks are not numerous, though there are several very extensive ones; as at Balda Pardee, at Nowsaree, Gundavee, and Chicklee. Near the sea, water is found in wells, at a short distance below the surface, but generally brackish; inland it is good, but more scarce.

North of the Taptee the lateritious soil prevails in the more inland parts : nearer the sea, the soil is chiefly black with intermixture of extensive tracts of clayey, sandy soil, particularly towards the rivers; nearer the sea, sandy downs are frequent. The river banks contain many calcareous nodules, and much gravel, mixed with the sand, and clay. At one part of this district, viz. between Hursoorum and Panowlee, a rocky belt extends across the pergunnah. I have not traced its extent, but I conclude that it must reach nearly, if not quite to the sea. The rock is hard; character primitive. It might be useful in case at any future time a road were to be made in this part of the country.

Bed of the Nerbudda, and its immediate neighbour-

hood sandy, and occasionally muddy, no where marshy. On the North side of the river, we have the banks high, consisting of sand, and clay with calcareous nodules intermixed: ravines are here frequent and deep. Beyond these to the North, the great alluvial plain which forms the whole of the Broach pergunnah, two thirds of the Korril, and Sinnore pergunnahs, and two thirds of the Duboy pergunnah, and nearly the whole of the Jumboseer pergunnah, extends, a dead flat, having its continuity, interrupted only by the intrusion of a largle angle of the Baroda districts, commencing from Miagong. This latter tract commences at Miagong, and is continued throughout the Baroda districts, in the forks of the Dadur, and Veshnamuntree rivers, as far as the Myhee. In the whole of this extent, forming a breadth of thirty-six miles, we have first in order of frequency the reddish brown soil very rich and fertile; 2d in frequency the barren soil of sand, kunkur and gravel; and 3d, the black soil.

This reddish brown soil is continued in great abundance from Baroda towards Champaneer and the Barria hills: much black soil, as usual, in the lower levels. In the whole of this country, vegetation is most luxuriant, but towards Champaneer it is a rich waste, remaining uncultivated in two thirds of its extent; and thus it continues to the Myhee river.

When clear of the very ravinny, dry, and barren banks of the Myhee, where a compound sandy, and calcareous soil exists in the higher elevations, and shelvy sides of the ravines; while the lower levels are composed of clay, and sand having a great admixture of pure Carbonate of Soda, we reach the level of the Napa, Pettad, Neriad,

and Boorsud pergunnahs. There the soil is a deep brown, sometimes with a greyish tinge very favourable for the growth of all sorts of produce, but more especially applied to the cultivation of tobacco, Indian corn, castor oil plant, carrots, &c. and latterly extensively employed for the culture of the poppy. Black soil exists in the lower levels but the brown, and greyish or "Gorat" as it is called, greatly predominate. The same remarks will apply with little variation to the Kaira Moonda, Tasra and Kupperwunjee pergunnahs: lower down in these districts, viz. by Soojitrah, Dolka, Cambay, &c. the black soil is by far the most common, and continues so along the sea shore. North of the Karee river, the greater part of the land is of the same brown soil already mentioned, and this extends with little variation northward to Morassa and Tintui via Hursole.

In this tract the purely black soil does not amount to one fifth of the whole. To the north and N. W. of the Saburmuttee, looking towards Deesa, and Puttun the soil has more of the sand and less of clay, than is the case in any of the districts to the southward; but it is only when we approach the Run that much of the soil becomes so light as hardly to yield a remunerating return, and to be more profitably employed as a grazing district. Up towards Kheyraloo, and generally indeed along the Suruswuttee, there is much fine land, and the country has at one time, been greatly more populous than it is now, as is shewn by the remains of gates, and of towers about most of the villages in this "Kanta," standing far out from the present inhabited limits.

As we approach the Eastern or hilly boundary of this Northern division we find low rice bottoms, under

the hills, but the prevailing soil is stony, and where free from stones, very favourable to vegetation. In the forks of the northern rivers are extensive tracts of light sandy soil with ridges, and ravines. On the whole, this northern division of the province has as great or greater capabilities for supporting a numerous population, than any other part of Guzerat, but very much of the land is uncultivated, and overrun with grass, or thin jungle. That many of these wastes were formerly under the dominion of the plough, is sufficiently proved by the numerous wells, and baolees of the most substantial construction, found all over the country. The great famine of 1803 is the period from which much of the desolation is dated.

Let us now enumerate a few of the vegetable productions of this rich province; and here be it observed that I will confine myself as much as possible to those products which bear immediately, on the topographic features of the country, as there is no occasion to enter minutely into the peculiarities of culture, &c. but merely to show what particular productions are to be found in each district, as these have often a most important influence in its salubrity.

Sugar Cane. This flourishes in every part of this province, but seems to be more especially the staple of the Southern districts, or Attaveesy, and of these the Gundavee, Soopa, Bulsar, Parchole and Nowsaree pergunnahs produce by far the greater quantity. In the Durrumpore soil, the cane flourishes without watering. On the Taptee there is comparatively little, save, in the immediate neighhourhood of Surat. In the districts towards the Nerbudda rather more; in the Duboy, Baroda and

Chandode districts, all along to the Myhee, there are very extensive plantations: in the Broach, and Jumbooseer districts, comparatively little. In the Neriad, Kaira, and Ahmedabad districts, much: there is less in the black soil of Dolka and Cambay; and throughout the whole country North and West from the Saburmuttee to the Suruswuttee, on one side, and to Eder on the other, it may be grown to any extent, and of first rate quality.

Rice. Is grown more or less in all the districts under the hills, especially in the pergunnahs of Chickly, Bulsur, &c, and in various places along the coast, also in the alluvium near the sea throughout the whole extent of the province. In the Duboy, Sawekhera and Baroda districts much is raised, as also in the lower lands of the Tasra, Kupperwunjee, Kaira and Dholka pergunnahs. In the lower parts of the Ahmedabad districts much is also grown, and of very fine quality. To the northward it is rather an occasional than a regular product, and to be found chiefly in detached spots fed with water, by the overflow of tanks.

Wheat. In the most clayey situations of the Attaveesy, and all along the tract of coast—alluvial soil, wheat is an important product, as in such soil it grows without irrigation.

I believe, however, I am correct in stating that to the South of Surat but little land is devoted to its cultivation, probably from the circumstance of the Sugar Cane affording better returns.

In the district between the Taptee and Nerbudda a good deal is grown. In the Broach and Jumboseer pergunnahs there is also a good deal.

In the Kaira and Dholka pergunnahs there is also

much, and in the lighter soil to the northward, it is pretty extensively grown, by means of irrigation.

Jowaree, or Hoclus Sorghum. In the most Southern pergunnahs, is sparingly grown. On the borders of the Taptee extensively, also in the whole of the Oolpar and Hansot districts. In Broach, Duboy and Jumboseer pergunnahs, it is the usual relieving crop for the cotton soil: northward it is a principal article of growth.

Barley. Grows well, but does not seem to be grown extensively, and chiefly for religious purposes.

Bajree, Holcus Spicatus. Is grown extensively throughout the whole of Guzerat, on soils of third rate quality, and also in better soils which in the cold season are devoted to other crops, this being a product of the rainy season. Least of it, is grown to the South of the Taptee; much from the Taptee to the Saburmuttee; and throughout the country from the Sauburmuttee to the Burnass it forms the great staple for the food of the inhabitants and their cattle. The grain is by many preferred to wheat, as a food.

Cotton. Is grown in the Southern Attaveesy as an occasional crop. As we approach the Taptee, it is extensively cultivated, particulary in the Bratcha and Teemba districts. Between the Taptee and Nerbudda, chiefly in the Hansot pergunnah: of the Broach Korril, Duboy and Jumboseer districts, it forms by far the most important, and frequent product; crossing the Myhee, and in all the districts north, it may be said to be an occasional article, rather than a staple. The species which produces the cotton in the Ahmedabad districts and in the brownish soil, generally is a triennal, a larger plant than the other. I ought to mention that the annual

kind is extensively grown in the Dolka and Dundooka pergunnahs.

Castor Oil Plant. An important product for domestic purposes, and also as an article of export. The rich garden soil of the Attaveesy produces it, in the greatest perfection, insomuch that the common oil, sold in the bazars there, as lamp oil, equals in purity, the finest from Apothecaries' Hall.

It is grown aboundantly too, in the other parts of Guzerat, but the quality of the oil, does not seem to equal, that first mentioned.

Tobacco, Nicotiana Tabacum. Is an extensive export from the Neriad, and Petlad districts exported seaward, and much also goes to Marwar, and the extreme N. W. towards Scind. It is also a common growth in other parts of Guzerat, but generally not for exportation.

Curcuma, or Turmeric. Some is grown, in the garden land of the Attaveesy, much in the Baroda pergunnah: it is not commonly cultivated, any where else, in the province.

Poppy, Papaver Somniferum. Has of late years, been pretty extensively cultivated, in the richer brown soil of most of the districts, on, and north of the Myhee and might be grown, to any extent.

Cussoomba, Carthamus Tinctorius. Little of this is grown, and it probably, does not succeed so well in Guzerat, as in the more elevated lands of the Deckan. It is chiefly grown on the Watruck river and in the Dolka, and Ahmedabad districts.

To these the principal products, I might add the names, and localities of a great variety of leguminous,

and other vegetables, which are most extensively cultivated for food, and many for export, but I (studying brevity) add only the following.

Kodra, Paspalum scrobiculatum. Grown in many of the poorer soils, and often stored up, as a resource in famine, the capsule being so thick, and horny, as to be impenetrable to insects: it is said, that it will remain good for twenty years.

Gram, Cicer arietinum. An article of import, from the Deccan to the Southern districts, as far as Broach. At Baroda, and Kaira, the supply raised, suffices for consumption, and to the northward of Ahmedabad, it is raised in such quantities, as to be very cheap.

Trees, Shrubs, &c. The whole of Guzerat, excepting the extreme northwest, the lands, near the sea, and the cotton districts, may be styled, a well wooded country. The varieties of trees, give a pleasing diversity of feature, to the fields. As this part of the subject, is important in its relation to medical topography, I shall consider it, a little in detail.

To the Southward, much of the land now cultivated, seems to have been, within the last 150 or 200 years, reclaimed from the jungle, and on most of the hills, the hillocks, and the vallies, we find jungle trees, still growing in abundance; on the higher parts of the former, we meet the *Celastrus,* of several species, occasionally, the *Morinda* of two species; *Ziziphus, Cordia, Sterculia urens, Nauclea Cadamba, Grewia asiatica,* the *Carissa Carandas or Corinda, &c. &c.* while in the vallies, by the sides of streams, and in hedges, the *Dalbergia arborea,* useful for its wood, and the oil extracted from its numerous seeds, is very common; the

Grislea tomentosa is also abundant, *Ventilago madraspatana*, *Combretum Ovalifolia*, *Cœsalpinia Bonducella*, and sometimes *Sepiaria*, &c. abound ; and immediately, in the neighbourhood of Daman, the *Semicarpus anacardium* grows luxuriantly ; I suspect, it has been originally brought from Goa, or Malabar. In this Southern district, the fields are studded with mango trees, and ever, and anon a lofty *Bombax*, or silk cotton tree, may be observed, bowered in, by extensive climbing shrubs, and with its fine crimson flowers, disputing the palm of brilliancy with its neighbour, the *Erythrina*.

Towards the coast are seen, many fine specimens of the *Adansonia*, with its grotesque, and immense stem, large white flower, and immense fruit, the latter valuable to the fisherman, as affording him a float, for his nets. The wood too, is so light, that the fisherman often carries on his shoulder a great log to be used as a float, or catamaran in fishing, or duck-catching on the tanks. The pulp of the fruit, affords a pleasant acid, used by the Hindoos, &c. as medicine, and as a basis of sherbet ; I do not think they are aware, of the virtue ascribed, by the Africans, to the leaves, eaten with food-viz. preventing excessive perspiration. In this part of the country, *Galegas*, and *Indigoferas* of various species, abound. The flatter alluvion, near the sea, is not favourable to the growth of trees, the *Palmyra* being almost, the only conspicuous one. Advancing inland, and northward, we find in the Durrumpore district, much jungle, thickening as we advance, towards the Bansda valley, or gorge, where the country is again for a space, more open, becoming again, much more

dense, until it merges into the extensive jungly district, called the "Dang."

This tract has a breadth, from the cultivated country to the Ghats, of from twenty to thirty-five miles: the whole of this, may be said to be jungle, varied only here, and there, by small patches of rude cultivation.

In this jungle, the quantity of underwood is small, but high, and coarse grass supplies its place. This jungle takes a N. E. course, following the trend of the hills.

The Teak tree grows here, in the recesses, and on the inequalities, to a great size; we have also the *Swietenia febrifuga*, very large, the *Bombax* as before mentioned, *Eugenias* of various species, *Bignonias* of varied, and beautiful forms; *Rottlera tinctoria, Sterculias, Diospyros glutinosa, Pterocarpus Marsupium*: sundry species of the *Gardenia*, *the Cassia Fistula*, and many gigantic *Acacias* of varous species. Whole tracts of many acres are covered with the *Acacia Catechu*, and the *Bassia latifolia*, or Mhowa tree sends its nauseating, and stupifying perfume, throughout the whole of the jungle.

The *Butea frondosa* takes its usual place, wherever there is rich soil, and a clayey bottom. We find also a species of *Grewia*, the majestic *Careya arborea*, and *Barringtonia acutangula*, the *Ixora parviflora*, the *Erythrina suberosa*, all in great abundance; nor ought I to omit, in this enumeration, the various species of the bamboo; but there this tree is of a size, inferior to that which it attains in the more luxuriant jungles of Ava, and Sumatra, and (I believe I may also add of Malabar) The *Pentaptera arjuna*, and *coriace a*

the *Dalbergia arborea*, *paniculata*, and *sissoo*, the latter furnishing the seesum, or what is commonly called, Blackwood, are commonly found, and an undescribed species of *Ziziphus*, with an oblong berry, furnishes in the hot season, a foot largely used by the dwellers, in those wild tracts. The above enumeration will I think be found, to include the kinds of trees, most commonly met with in this jungle. There are I know, many others, but as they were not in flower, when I visited the district I had not an opportunity of knowing, what they were. The flower of the Mhowa is so abundant, as to form a large article of export from the district, and for the purpose of collecting these flowers, various gums, and other products, and often for distilling Mhowa spirits, from the abundant materials met with on the spot, Parsees are scattered at various detached stations in the jungle. These people drag out a miserable, unhealthy, and shortened existence, in pursuit of their calling. Of the spirit distilled on the spot, they exchange a good deal, to the savage people, by whom they are surrounded, receiving in return, gums, charolee seeds, axle-trees for carts, &c. &c. Their custom too, is a good deal kept up, by selling spirits to the peasants who resort to these jungles, from the seaward pergunnahs, to carry teakwood, bamboos, rafters, &c. to the Coast, or to the Surat districts.

This is a branch of trade extensively carried on. The Koonbies of the Bulsar, and other Southern districts, so soon as their crops are housed, start for the jungle, and bring back from thence, loads of wood, or of bamboos. In the course of the season, they make two or three such trips.

Of the smaller plants in this district, we have *Arums* of different species, some edible, and others rendered so, by preparation. *Crinum Indicum* is found too in great abundance, in the bed of the rivers, and streams. It is said by the people, to have a most baneful influence on the quality of the water, acting especially on the spleen. I recommend this subject as worthy of farther investigation: this much I can say, that in the Ganges, the *Crinum* is not common, and yet, enlarged spleen is a very common disease in lower Bengal; but as I speak on this matter from memory, I do so hesitatingly. In the hedges of the Attaveesy, the custard apple, or *Anona squamosa*, is very commonly found, and in the Durrumpore district, the *Convolvulus turpethum*, which affords a most useful substitute for jalap, abounds.

In the more barren lands of the Chickly, Mhowa, and Soopa pergunnahs, and from thence to the Taptee, the date tree is of very common growth.

The extraction of its liquor, affords employment to thousands of people, it being in extensive demand, partly for distillation, and partly for drink, in its natural state. On the banks of the Taptee very extensive tracts are covered with the *Acacia Arabica*, and here its growth is attended to, as affording a ready, and sure profit; it often reaches a great size. In the ravines, all along the upper part of the Taptee, towards Mandvee, Kurrod, &c. the *Cassia fistula*, *Butea Frondosa*, different *Acaias* and the *Helicteres isora*, are the trees, most commonly found; to these, I may add the *Feronia Elephantum*. The beds of the Attaveesy rivers are, from their nature, but sparingly cultivated with me-

lons which form so extensive an article of produce, in the more northern, and sandy rivers of Guzerat proper. The tamarind abounds all over the province, but chiefly in the more cultivated parts, and about towns. The same may be said of the *Hyperanthera moringa*, *Æschynomena grandiflora*, *&c. &c.* *The Cucumis Colocynthis* is very common on the Southern shores.

The garden grounds of the Attaveesy, are luxuriantly diversified with mango trees, jack trees (*Artocarpus Integrifolia*), *Mimusops Elengi* (*Bugool*), *Cicca disticha*, *Averrhoa Bilimbi*, *Santalum Rubrum*, *Uvaria longifolia*, &c. &c.

The palmyra tad or *Borassus flabellifomis is*, as I before remarked, common, rather, towards the sea than inland.

It is in detached, and extensive clumps, generally in a dry spot, amid surrounding moister soil. There is here a variety with branches, not mentioned in any botanical works, which I have seen.

The palmyra toddy is much esteemed by many classes of the natives, and especially by the fishermen, and khulassies of this coast.

The leaves are of extensive use in domestic economy as coverings for houses, boats, &c. and the trunk when decayed, and valueless for product, is cut down, and used as a conduit for water.

Between the Taptee, and Nerbudda, the country is thinly wooded in its lower part: as we advance towards the hills, jungle at first low, and afterwards more luxuriant, is met with.

The barren sandy, and kunkery ridges, and banks of nullahs, and rivulets are covered with the *Cassia auri-*

culata ; stunted *accacias* of sorts, and *Capparis aphylla* are also common. Many fine mango trees, also the *Ficus Indica,* and *religiosa,* and *Feronia elephantum* are found, on the banks of the Nerbudda.

In the Broach, and Southern Dhuboy districts, trees are found only in the immediate neighbourhood of the villages, as the unmixed black soil seems not favourable for the vegetation of the generality of trees, and their growth is found, (where allowed) to interfere, with the growth of cotton, &c. sown near to them. Each village has generally, a plantation of *Acacias*, the branches, and bark of which are used by the village tanner, and the wood by the carpenter. At most villages too, there are a few luxuriant Banian, and Peepul trees. There are in these cotton districts, few or no hedge-rows. Immediately after leaving this district, and entering the angle of the Baroda pergunnah, beyond Mhyagong, the character of the tree vegetation changes : trees now abound, and most of the fields are skirted with the *Tamarind, Mango, Banian, Peepul, and Ficus racemosa.* The hedge-rows are thick, and luxuriant, composed of the *Euphorbia antiquorum,* and *Euphorbia tirucalli,* the *Cœsalpinia Bonducella, Asclepias* of various species, &c. &c.

Thissort of country is continued on, to the My hee river, and in the rich lands about Baroda; the view is on this account, particularly picturesque. Inland from Baroda, towards Champaneer, the Northern part of Duboy pergunnah, and the Sounkhera, and Behadurpore Districts, the further we advance, we find the jungle gradually usurp the place of the cultivation ; the trees are more thickly studded in the fields, and waste places ;

the *Butea frondosa* springing up in the lower levels, a sure sign of approach to thicker jungle; and in this tract, the Palmyra tree, again becomes common. In this district may be seen, one or two extensive plains, covered with the Palmyra, growing up, through the *Ficus Indica*, or Banian tree. I know not if this combination be accident, or the result of design; from the extent of continuous ground covered, one might infer, the latter to be the case. The jungles about Champaneer, are thick, and dangerous; the same is the case with the Barria jungle. The latter district furnishes much lac, (the produce of the Lac Insect, "Coccus Lacca," on the branches of the Peepul) as an export; also the wood of the *Dalbergia Sissoo*, in great quantities; that of the *Pentapteres* or "Sadur," that of the *Butea Frondosa* in great, but generally crooked logs, not to be distinguished from teak, when manufactured; also much Mhowa wood, useful for beams, but not bearing division; also much of the Mhowa flower for distillation and the berry of the *Buchanania latifolia*, which resembles in taste, an almond. The *anacardium orientale* nut or "marking nut" is also pretty extensively exported.

Crossing the river Myhee, and when clear of its ravines and broken, dusty ground, we enter at once on a country, most luxuriant in hedge-rows, and trees. The hedges are composed of materials, much the same as those in the Baroda pergunnah. The trees consist generally, of immense, and umbrageous mango trees, the tamarind equally so: *Sapindus Saponaria*, &c. &c. and in addition to those met with in the Southern districts, we now find the *Keemi* or *Mimusops Hexan-*

dra, more, and more abundant, as we advance North, and North West till we reach Beesanuggur, North of which it decreases in frequency, and soon disappears. It is a tree of great importance to the cultivator, furnishing from its berries, an extensively used article of food, in the hot season; while the wood is of the greatest use, in making beams for the sugar mills, coffers for wells, &c. &c. Ascending the Seeree, the Watruk, and Meshwa rivers, we find the low jungle increase ; it is principally *Acacia Arabica, Capparis Aphylla* and *Cassia Auriculata.* The *Butea* too, is so common, as to give the whole of the jungle, a bright red hue in the early part of the hot season. North, and North East by Dehgong, Hursole, and Morassa, the Mhowa tree is to be found in every field; a locality very destructive to European troops who may happen, to be employed in this part of the country, on account of the facility of getting liquor. Crossing the Suruswuttee, trees are not found, in such abundance, as is the case to the Southward of this river, but in the immediate neighbourhood of all the villages, the *Banian Peepul;* and *Acacia Arabica* are grown, and attain a great size.

Further North, as about Deesa, and towards the Run, *Acacias* are the trees most common, but here, they are of stunted growth, seldom exceeding eight or ten feet including the top.

And here to the N W., extensive plains are covered with the *Capparis* and *Cassia Auriculata.* In the tract which borders on the Run, trees are rare, but the grasses are luxuriant, and fine.

INHABITANTS. It is hardly possible to comprize, in one general view, all the different classes, who inhabit

Guzerat, as each district besides the classes common to all, contains some peculiar to itself. Thus in the Southern districts, the most numerous classes are *Doonjas, Chowdrias*, and *Bheels* of the Dang.

The first are a small, but well knit, and active race, most of whom are now settled as cultivators, but still retain many of the propensities, peculiar to the savage life: I mean the harmless propensities, as regards their fellow-men: they are active in the pursuit of wild animals, particularly in killing, and ensnaring the larger game.

They are a quiet set of people, but much dreaded by all other classes of natives, as being powerful sorcerers; and it is even a common belief, that they can extend the influence of their charms, over the tiger, and other ferocious animals; an idea which doubtless has had its origin, in the fearlessness with which, these people approach the tiger's den, trusting to their own agility, to escape, or to use their light offensive arms, as occasion may require.

They do not profess Hinduism, have no castes, or distinct priesthood: their temples are lofty Cotton trees, where, these happen to be grown round with creepers, and other shrubs: and here upright stones are generally placed in rows, or in circles.

The chief seat of this people, is in the Southern pergunnahs, inland from Parnera by Durrumpore to Bansda.

2. The *Chowdria*: This class of people is found chiefly, in the Mhowa Walor, Kurrode, and Biara pergunnahs, towards the Taptee. Their chief resides at Nuldurra in Mhowa.

They are a stouter, and more robust race than the *Doorias*, and their features would denote, a different origin. The women are particularly robust, and very strong. They may be generally known, by being adorned with immense strings of cowries, variously disposed about their head, and neck.

Their habits, and pursuits are much the same, as those of the *Doorias*, and like them they are much dreaded for their supposed skill in witch-craft, especially the women, and vast numbers of women of this race are to be seen, who have been deprived of their noses, on suspicion of being witches: nor is the use of this remedy, by any means extinct, as it is still mantained in full vogue in the Soneghur, and Biara districts.

I believe, that the greater part of the fishermen of the Attaveesy, are an offset from this tribe and the next to be mentioned, viz. the Kolies, which are hardly a distinct tribe, here, in the Attaveesy, as is the case, to the northward, and *Doorias* and *Chowdrias* are often called, (by mistake) *Coolies*.

3. "*Dooblas*," called also *Coolies*, but this term, as I have before remarked, is here, of most indefinite signification. Many of the *Dooblas* are slaves, some free, and of the slaves, or Halees, most are hereditarily so, while others are in voluntary bondage, on account of advances made by their temporary masters, who are most generally Bramin landed proprietors, or Patells. I have heard of one proprietor in this district who possesses three hundred.

They are employed by their masters, in cultivation, fishing, &c. and are often let out on hire, particularly as Beldars. Their masters bear the expense of marri-

ages, provide them with houses, &c. and often allow them a certain number of Date trees for toddy, to which they are all much addicted. They are generally, not a robust people, and appear to break down early, partly, from the effects of labour, and partly, from their intemperate habits.

4. *Bheels.* These people, chiefly inhabit the Dang, that thick jungly district, which stretches from Bansda to Soneghur. They do not differ from the Bheel, in other parts of India. From the extreme insalubrity of the district they inhabit, they are subject, from childhood to fevers, chronic spleen-disease, and general abdominal tumefaction, and hardly one of mature years male, or female is to be seen, without an enlarged spleen, and prominent belly. They are short lived.

5. *Parsis.* This class is very numerous in the Attaveesy, inhabiting, chiefly the large towns, and living by merchandize, weaving, agriculture, toddy drawing and distilling. They are generally quiet, and industrious, but in this quarter, they are ignorant, and superstitions to a degree which would hardly be believed.

6. *Koonbies* are comparatively few in number, and many of them settled here, within the last two or three generations.

7. *Bramins,* chiefly of the Oonawul tribe, are numerous. They are mostly landed proprietors, or village officers, and possess many slaves.

8. *Musalmans.* To be found in the towns in much the same proportion, and occupations, as in other parts of the country. There are a few villages of Bora cultivators to the Southward, and many more, in the Mandvee district, on the Taptee, and are, as is the case in

other places, most industrious in their calling. I need not advert to the numerous, and varied population of Surat, as I hope to see that subject statistically, and medically noticed by some of my Brethren, better fitted for the task, than I am. I therefore pass on to the districts between the Taptee, and Nerbudda, possessing a population, composed of much the same materials, as that of the Attaveesy, save that here Bheels, and Coolies are the only distinct classes of the more savage part of the population.

I cannot say, whether there are slaves in this part of the country. I have not heard of any. Parsis are less numerous than in the last mentioned district, but still numerous, particularly, towards the sea. Bramins as landholders, and village officers are particularly numerous, in the Oolpar pergunnah.

Among the various classes in the districts North of the Nerbudda, the Koonbies, or cultivators may be first noticed.

They are of two classes, or tribes, one of those classes acknowledges a sort of spiritual and lay head, or as he might be called a lay Pope, who resides at Oonja in the Puttun, or Sedhpore Zillah. His authority, is deemed infallible, in all disputed points relating to caste: he issues orders every twelfth year for marriages among the caste, and on such occasions, even the youngest children are betrothed.

The Koonbies of both classes are a robust race; in the Southern, and midland districts, very temperate, but further North, frequently indulging in the habit of opium-intoxication, frequent among the Coolies, and Grassias, by whom they are surrounded. They use a vegetable diet, and are forbidden to eat flesh.

2. The cultivating Boras are numerous in the Broach, and Jumbooseer pergunnahs, but hardly to be met with in the Northern districts, as cultivators. From physical character, I would infer, that they have a different origin from their brethren in the towns, being always tall, strong, raw boned, and hard featured. They have much the appearance of Arabs. They are temperate, and appear, seldom, to eat flesh, but this probably is as much from necessity, as from choice.

3. The *Grassias*, or Rajpoots. This class is very numerous in all the districts, North of the Nerbudda, most villages having several families, either proprietors of lands, or having established claims, on the produce of the lands of others; and more rarely as simple cultivators. They maintain, and cling to the recollection, that they were Lords of the soil, throughout the whole of Guzerat, till deprived of three fourths of it, by the Emperor Akbar. They are a robust, and handsome race, but indolent, and much given to intoxication, consequently their lands, are often mortgaged, or irredeemably pledged.

To this class is owing, much of the insecurity to property which has always prevailed in Guzerat, as they can at all times command Coolies, or Bheels as followers, in any expedition for plunder, or revenge. Their Rajas are numerous, and still powerful in many parts of the country, particularly, towards the Eastern boundary of the province. This class eat animal food rather largely, when they can get it, but abstain from the cow, the buffalo, and often from the sheep, when white, or marked with white spots.

4. The *Coolies* are a very numerous class in all the

districts on, and North of the Myhee river, and in the upper parts of the various rivers to the North; and throughout the North West frontier of the province, they form the bulk of the population. They are generally a robust race, strongly made, resembling in this respect, rather the Burmese, than their Hindoo brethren; in their diet they use flesh, and some of them eat the Buffalo. They are fond of liquor, and much given to opium. Their occupations are those of cultivators, guards of property, and carriers of money, (especially gold) and too often thieving, or high-way robbery.

Bhats and *Charuns.* The former are a numerous class in the midland districts of Kaira, Moonda, Neriad, &c. and they are found, more, or less scattered over the province. They are a tall, well limbed race of men, not industrious, but quiet, save when their religious tenets are interfered with; at such times, they destroy the more aged, and helpless members of their community and wound themselves, generally, in such a way, as to make the greatest possible appearance at the smallest expense of structure, as I particularly remarked eight years ago, when many were brought into Kaira, wounded on account of a revenue dispute. They all indulge, more or less freely, in opium, bhang, or distilled spirits.

6. *Buneyas, Bhoras* and other Musulmans with numerous Hindoo artificers, and manufacturers, compose the bulk of the population of the towns. It were endless, to enter into a separate account of all these. I will therefore, close this part of the subject, by merely adverting to the numbers of semi-migratory tribes, in the North West, who live by breeding cattle, and camels; to the numerous gipsy tribes, Beldars, &c. &c. who have no

fixed habitation, but carry their rude tents from place to place in search of work. To the bodies of Gosaens, and other travelling mendicants, who naturally flock to a rich country like Guzerat.

The Gosaens in particular, have many wealthy collegiate establishments in the province, in which learning is furnished to their disciples, and food to the travellers of their sect. The principal of these is at Sedhpore, on the Suruswuttee. Nor must I omit to mention, as a separate class, (for to all intents and purposes they are so) the eunuchs, who are still manufactured in great numbers, at a place named Bechrajee, situated between Ahmedabad, and Puttun. Here resides their Gooroo, to whom offerings are made by those, in the most distant parts of the province.

Finally. The Bheels exist plentifully, in the mountainous tracts on the Eastern boundary. Some of those, in the Aboo range of hills, are said to be cannibals, but I have had no opportunity of verifying this report; and it is probably an exaggeration, for it is not one hundred years ago, since the Scottish Highlanders were believed by many ignorant people, to have similar propensities.

HABITATIONS. Throughout Guzerat, the people are comfortably lodged, the houses varying in kind, according to the greater, or less supply of particular materials, in each district. Thus in the more jungly situations, the houses are of mud, or wattle with grass roofs, while in the more cultivated, and cleared tracts, we have earthen, or brick houses (most generally the latter) with tiled roofs.

Flat terraced roofs are never found, excepting in the

houses of the rich. Towards the North West, grass forms the chief material of the houses.

Throughout the province, the houses are built, so as to exclude currents of air, from which cause they become so heated towards evening that the inhabitants, particularly in the towns, sleep in the open air, wrapped in a sheet which also covers their head, a good preservative against insects, and probably also against malaria.

Food. On this head I may state generally, that upwards of two thirds of the inhabitants, are restricted to a vegetable diet, either from religious motives, or from necessity: but of edible grains, and vegetables, the variety is great; pulse of sorts is in common use with all. The eaters of rice bear a proportion to those who use wheat, bajree, &c. as about three to ten. In the jungly districts the natives understand the art of rendering many of the acrid *arums*, palatable. The *Arum Campanulatum* is extensively grown, about the districts on the Taptee, and Nerbudda, and forms a common, and palatable vegetable. Fruits (if we except the Plantain, Keemi and Melons) are not so common, or cheap, as to be, within the reach of the lower orders of the people. The sugarcane affords a bountiful resource to all classes, and also to cattle. In most parts of the country, not immediately on the great roads, it is the custom, to give a portion to every passing traveller, *gratis*, and the Goor, or course sugar, forms a large, and salutary item of diet, with all classes. For culinary purposes, oil is very generally used. Milk is a more common article of diet, north of the Myhee than to the South of that river, and in the great grazing districts to the north west, it is most abundant. The butter milk is generally

used, made into a curry, or drunk thickened with raw Bajree flour. In the larger towns, flesh is generally so cheap, as to be eaten by the lower classes, but only in the towns. To the north of the Sauburmuttee it is more common, and oftener eaten.

Fish. The rivers, and tanks are generally well stored with fish, but in many parts of the province, the Jain Buneyas, or the Bramins are sufficiently powerful, to prevent fishermen from catching them, and they can be taken, only by stealth; in other cases, where they dare not openly prohibit the practice, they endeavour to do so, by bribing the fishermen.

The sea coast abounds in fish. The *Prawn*, and the *Bummalo* are of all the most common, and attainable by all classes. In the great rivers Taptee, and Nerbudda, the annual visit of the *Helsa*, or Sable fish, to deposit its eggs in the mud banks, gives a most abundant supply of food, and the roes are dried, and stored up for use, and exportation to the inland districts. It has been said, that this fish is peculiar to the mouth of the Indus, but this is a mistake; I believe it exists, in all rivers which have their mouths much obstructed by mud banks; and in none, is it found more abundantly, than at the mouth of the Ganges. It is generally said, that this fish is very heating, and predisposes to fever, but this idea may have arisen, from the circumstance, of the Helsa season, and the fever season being synchronous; just as in China, where the excessive use of oranges is held, as a cause of fever, from a similar synchrony. The *Wagrees*, and most of the various wandering tribes, will not scruple to eat any thing animal, from a rat to an elephant.

Intoxicating Liquors and Drugs. I have already

alluded to the extensive use made of toddy, and spirits, in the Attaveesy. The same remarks will nearly, apply to Surat, and the districts as far as the Nerbuddah, including the town of Broach. Here a change takes place. The cultivators (by far the most numerous class) in the Broach, Jumbooseer, and Baroda districts, may be safely characterized, as rather temperate. As we approach the jungle in the eastern, or back portion of the province, between the Nerbudda, and Myhee, the Mhowa spirit is much in use, and most villages of any size, have their dram shop. North and East from the Myhee river in the Hursole, Morassa, and Eder districts, spirits are an extensive article of consumption; as the materials for producing them, exist in great abundance on the spot. Throughout the province, the Grassias, generally prefer opium to spirits; among the Coolies of the Northwest, opium is almost the only stimulus used, as the materials for spirits are here rather scarce, and dear; and the art of distillation from the sugar cane, does not appear, to be generally understood to the northward, though some of the Rajas, and Thakoors, as the Raja of Mandwee on the Taptee, distil it for their own use.

I have heard, of some of the more debauched among the Rajpoots, using the Nux Vomica as a stimulus, and this to the extent of two of the seeds per day, but the practice is not general.

Tobacco. Is largely used, throughout the province; the Rajpoots in particular, are seldom to be seen without a Hooqu, and to them, it is rendered more necessary from the quantities of opium they consume. Hence the enormous size of their chillums.

Bhang, or the juice of the Cannabis, is in very general use, but most so perhaps, to the southward of the Myhee. When the dried leaves of the plant merely, are smoked, it is then called Ganja. With all the lower classes of society, it is in daily use, and even the more sober, and respectable part of the community, often partake of it, at feasts, and merry-makings; but only, to such an extent, as to give a very transient, champagne-like stimulus, without disordering the intellect. Its excessive, or frequent use, is, I believe, most pernicious, far more so, than that of the other stimuli. It is said, rapidly to destroy the generative powers, the voice becomes broken, and the breathing short; I feel inclined to think, that it has special action on the Bronchial tubes. No habitual Bhang drinker, or Ganja smoker, lives to a great age.

Opium. I have before mentioned, its extensive use among the Rajpoots, and Coolies; Musulmans, Dhers, &c. use it also largely, and of the latter class a man seldom goes out to his day's work, or travel without his dose of opium. Its use, is said, to be on the increase. From all I have heard, and seen, I feel inclined to think, that it is by no means so destructive to life, or health, as is generally supposed to be the case. The subject is well worthy of farther investigation. In towns the trading class, particularly Hindoos, and Boras, are parsimoniously abstinent. The weavers are generally temperate, as are carpenters; braziers, ironsmiths, and most of the other classes of artizans will seldom refuse spirits, or opium, but riotous intemperance among them is rare, save in Surat.

Climate. This subject, as well as the two which

follow it, might have appropriately been included, after the account of the soil, and productions.

In the Southern districts, the vicinity of the sea, and the proximity of the mountainous tracts covered with jungle, tend to render the climate more mild, and the temperature throughout the year, more equable, than is the case in the other parts of Guzerat; and near the sea, the hot winds are comparatively little felt.

Farther inland, and in the immediate vicinity of the hills, the heat is greater, and in both situations, the humid and loaded atmosphere in the the S. W. monsoon, is often painfully felt, particularly at night. In the whole of this district, rain falls in greater quantities than to the northward. In the jungle districts to the East, the supply of rain, is said, never to fail, in the driest of seasons, and it often falls there, when none is apparent, in the more open districts.

In the midland districts, viz. those from the Nerbudda to the Sauburmuttee, the average of temperature throughout the year, is greater than in the Northern and Southern districts of the province. Here we want the open sea to temper the air, as it does to the Southward while the richer soil, and more numerous inclosures tend to render the nights hotter than is the case in the Northern division. The hot winds blow in this district, from about the 20th March to 20th of May, (varying of course in different years), and at this time the thermometer in a double walled tent, often rises to 115, degrees, while in a house, it may be 103 degrees : at such seasons, the Natives themselves often suffer from "coup de soleil," but with them the affection more often assumes the form of

causus, though with nearly equal, but less rapid fatality, than with Europeans.

North of the Sauburmuttee, the heat, from the beginning of March to the beginning of June, is more oppressive by day, than in the midland, and Southern districts, but the nights are greatly cooler, as the lighter soil, and the comparatively open country cool the air more rapidly, than in the other situations. Here the violence of the hot wind is great, and more distressing, from the quantities of fine sand it carries with it. After the 20th October, the mornings, and evenings are felt, refreshingly cold, and in the cold season, hoar frost, and ice are not uncommon, whereas, in the midland countries, they are rather seldom seen. I should only run into tediousness, and error, were I to attempt, to give the mean annual temperature of all the different districts; my other avocations have seldom permitted me, to make the detailed, and careful observations, necessary for extreme accuracy of result.

Mineral Productions. These are neither many, nor various; I am not aware, that metallic ores are worked, in any part of the province. The mouth of the Taptee, and probably, the whole bed of the Cambay Gulf, across to Gogo, abounds in a black sand, very rich in iron; and I have also, every reason to believe, that platina exists in it: I say this, from having witnessed the result of a series of experiments, made by my ingenious friend Assistant Surgeon C. F. Collier. With more perfect means at his disposal, he might have been able to separate the platina, from the other ingredients; as it was, he did not succeed in doing so, but his experiments appeared decisive, as to the existence of the metal.

Agates, and Calcedonies abound on the banks of the Nerbudda, whence they are dug, and exported to Cambay. The Kupperwunje hills also, abound in agates, and beautiful Jaspers, which are exported to Cambay, to be worked. From the country, just beyond Deesa, towards the Run, a softish stone, composed apparently of marine remains, fantastically embedded in yellow clay, is brought; it is cut into a variety of ornaments.

The Hilly range, from Aboo to Daman, has been, I rather think, very little explored. The part of it which I have examined viz. that, to the north of Morassa, and from thence, towards the Deybur Lake, appears to afford black, and white marble in great abundance; also slate formation. In the Unawal districts, to the Southward, I have heard that there exists, an extensive mound of fine white clay, traditionally said, to be artificial, and it is farther stated, that ancient utensils, or ornaments are sometimes found, embedded in it; possibly there may be, animal, or marine remains. A similar mound, is said to exist, in the Hansot district. I have not seen, either of them, and merely, give the common report, in order, to stimulate farther enquiry.

I believe, I have already spoken of the soda, which exists, so extensively mixed with the soil, in the tract extending from Baroda, to Kuppurwunje. It is extensively used, at the latter place, in the manufacture of soap, and of glass.

Wild Animals. The Lion, is frequently found, in the country north, and west from the Myhee river, but more especially, to the west of the Sauburmuttee, and northwards from thence. In size, and strength, equal-

ling the African Lion, but having apparently, a smaller mane.

Tigers, Leopards, &c. common, throughout the greater part of the province, but probably less so, to the northward of the Myhee, than to the southward of that river. There are many, in the ravines of the Taptee, Nerbudda, and Myhee; and to the south of the Taptee, they annoy the inhabitants of the most open part of the country; while in the jungly district there, they are so frequent, that the inhabitants, have to poison them by stratagem. There is a common idea, among the inhabitants there, that a lobe is added, to the liver of the Tiger, for every year of his life. Without offering any decided opinion, as to the correctness of this assertion, I may say, that by several gentlemen, experienced in Tiger slaying, it is said to be well founded; and certainly, we do observe, on examining the liver of a tiger, that it has, sundry detached hanging lobes which might be fancied, of recent formation, and we may further observe, that in most Tigers, the number of lobes differ. The subject, is probably worthy, of farther investigation. The fat, and synovia of the Tiger, are in great request, as an anti-rheumatic application, in native medicine, and, the whiskers chopped up, are said, to be sometimes administered, as a slow poison; and certainly, I know, of nothing more likely, to keep up, a lingering state of ill health, and finally to induce, disease destructive to life, than a collection of these bristly inmates.

Deer and Antelope. Common throughout the province, but certainly less so, north of the Myhee, than to the Southward of that river.

Nil Gao. Very common, in all the North Eastern

district, as up the Meshwa, and Sauburmuttee rivers, where they often herd, in great droves. They are rather rare, in the Southern districts. There are well authenticated instances of their attacking man.

Sambre or Elk. Common, in all the jungle districts, on the Eastern, and Northern frontier of the province; in the more open country, they are not found. The Wunjaras generally, pick up the shed horns, and sell them to the druggists, for medical purposes.

Wolves, Hyenas, &c. are found in most parts of the country, but the former are not very common; the latter, feed on the offal of the villages. I pass over, sundry other quadrupeds, less worthy of note, and go on to a cursory sketch, of the birds. Of these, the variety seems less, than in most tropical countries; of Ducks, there are five or six varieties, and they are more particularly common, in the extensive tanks, and rather sedgy streams of the midland districts: also in the various rivers.

The Flamingo, is found chiefly, in the muddy flats of the Nerbudda, and Myhee, and also, towards the sea, among the muddy banks, forming the "debouchure" of those rivers.

The Sarus, or Gigantic Crane, is met with, in great numbers, between the Taptee, and Sauburmuttee, and North of this latter river, the Kullum is found in great flocks; less frequently, to the Southward.

Adjutant Bird. Is pretty frequently seen, but, can hardly be said, to be common. The Bustard I believe, is rare. The Floriken is not very common.

Tame Animals. The Horse, does not appear, ever to have been bred to any extent, in Guzerat, and even

now, the supply is chiefly by importation; not that the climate, at least of the Northern division, is at all unfavourable to the animal; the contrary is proved by experience. The generality of the indiginous breed, reared by the natives, are under boned, and ugly.

The Ass small, and not very hardy. The Wild Ass, as found to the N. W., is a finer animal, having great speed, and not unfrequently, it is tamed, for show.

Cattle. The Southern districts produce them, of rather an inferior breed, and here, the wants of the cultivator, are chiefly supplied by importations of cattle, from the Northward, or from Malwa.

To the Southward again, the Buffalo seems more common, and rather superior, to his fellow of the North.

The cultivators of Broach, and Jumbooseer districts, import, the greater part of their draught cattle, chiefly, from the circumstance of their land, being too valuable, to allow much to be spared, for grazing. In the districts, between the Myhee river, and Kupperwunje, there is a fine breed of cattle, but I believe, this particular kind, is mostly bred, for sale.

North of the Sauburmuttee, and from thence to the Run, the breed is still finer, the cows being equal in size, and milking powers, to most breeds in England, and the Bullocks of the Kakreze districts, have long been celebrated, and sometimes 5 to 600 Rupees are paid, for a pair.

Camel. The Camel is bred, to some extent, North of the Sauburmuttee, and more frequently, as we advance to the N. W. It is quite equal in size, and power to the Camel of Marwar, but in general, cannot be bought, at a rate, nearly so moderate, as it can be procured, in the

upper provinces of Hindostan. I conclude, that the chief consumption of Camels, bred here, is by the caravans, which frequently proceed, laden with merchandize, from Gogo, and Dholera, to Pali.

In taking leave of this part of the subject, I may add, for the information of the lover of natural history, that in the Chicklee, and Bansda districts, there exists, a breed of wild cattle, different I believe, from the Bison found among the Ghats, and much less fierce.

I regret, that I had not an opportunity of seeing any of them, so as, to enable me, to determine the species, or variety.

Towns and general population of different districts. This is naturally an extensive subject, and the minute consideration of it, might in itself, suffice to fill a volume; as to any estimate of the population generally, I do not think there exist, data whereon to form it, nor is this to be wondered at, seeing that our territory is so greatly intermixed, with that of other states, and petty Princes. I am aware, that different census have been taken, of various districts belonging to the Honorable Company, but I have some reason, for not placing much faith, in the gross of these calculations. Besides the Company's territory forms comparatively, a small portion of Guzerat, and as to a census, in the Native states, it is difficult, if not impossible, to frame it, in the present state of our relations with them. I therefore, deem it hopeless, to attempt in round numbers, to give the amount of the population, and will therefore abstain, from doing so, as regards the districts generally; confining such statements, to the account of the towns, and Kusbas,

where we are able by an enumeration of the houses, to attain, something like accuracy.

To begin with the Southern districts. There, the villages are generally found, distant from each other, four or five miles; the towns are few, most of the Kusbas, such as Bugwara, Durrumpore, Bansda, Walor, Kurrod, Mota and Biara, being rather Bazar peths, than towns; seldom exceeding 700 houses, and inhabited by a few small traders, Bramins, followers, and cultivators. Towards the coast, we have a string of towns, favourably situated for internal, and external trade, and some of them in consequence of this, are rather wealthy.

Balda Pardee 12 miles from Daman, a town belonging to the Raja of Mandvee, containing about 1500 houses, and a good many Jain merchants. Trade is in wood, salt, jungle, and agricultural produce, especially rice.

Bulsar. A Kusba of about 7000 inhabitants, town ineligibly situated, amid broken ground, and tanks. Trade is a good deal, in salt to the Deckan, in return for grain and wheat, in wood, rice, coarse sugar, tiles, &c. A good deal of cloth is also made, and there are many houses of sailors, weavers, and cultivators.

Bella Mora. Two towns running into each other, and eligibly situated for trade, at the fall of several rivers, into a cross estuary. The houses are chiefly of fishermen, sailors, and Jain merchants : of the latter alone, there are about 300 houses.

Gundavee. A trading, and small manufacturing town of about 2000 houses ; many Parsis dwell here, and they have their agents, in different parts of the jungly country inland, to collect Mhowa flowers, wood, &c.

There are also many Buneyahs, who have their head quarters here, and drive a trade, by frequenting the inland, weekly Bazars; for few of the out villages in this district have a regular Bazar, and the inhabitants are mostly, dependent, on weekly markets for a supply of clothing, and of luxuries. There are also many houses of coppersmiths, and rice beaters.

Chickly. A town of about 800 houses, but considerable only, as being the Kusba town of the pergunnah, contains also a good many houses of Bramins, and a few merchants.

Nowsaree. A Kusba town, and residence of the Sirsoubah, eligibly situated, and surrounded by much rich cultivation, chiefly dry. The town contains about 15000 inhabitants; many of them Parsi weavers who work for the supply of the Surat market. There are also, many artificers, particularly workers in copper, and brass. Considerable trade also, is carried on, in gram, wood, coarse sugar, &c.

Surat. A city of ancient celebrity, and notwithstanding recent commercial revolutions, still possessing much trade. I feel inclined to think, that the common assertion, as to its rapid declension in population, and wealth, is not well founded, and may probably, have been made from a view of the quarter of the town, formerly inhabited by the wealthy Musulman population, which certainly is more than half deserted; but the Hindoo portion of the town, which has always been the most extensive, seems still well peopled, and busy, and the crowded state of the daily Bazars, affords farther evidence of a dense population. The present number of inhabitants I would estimate at 130,000.

In the districts, on the Taptee, are many large, and flourishing villages, partly agricultural, but chiefly manufacturing. Mandvee on the Taptee, the residence of a Raja, contains about 6000 inhabitants, but of these, a small number are engaged in manufactures.

From the Taptee to the Nerbudda, the towns, and villages (if we except Oolpar pergunnah, and a part of Hansot) are few, and scattered, and generally poor. The proximity of the Rajpeela country, and of its unsettled population of Bheels, and Coolies, renders property here, insecure, and consequently, the population is not nearly, so large as it might be.

The only towns in this district are Oolpar, containing about 3500 inhabitants, Hansot about 5000, Oclaseer about 7000, also Randeer the ancient Surat, about 9700 inhabitants. Crossing the Nerbudda, we find in Broach, a population of about 30,000, of whom many are Parsis. Weaving is the chief branch of industry here, and a considerable trade is also carried on, seaward, and inland to Malwa. Up the Nerbudda, Korul is a small Kusba, and Sinnore a large one, containing about 2000 houses, chiefly of Bramins, and cultivators; number of inhabitants, probably 8000.

Chandode, and Tulukwara are small, but considerable, for that part of the country. Beyond the immediate vicinity of Broach pergunnah, ascending the river, the villages are few, and scattered, and much good land is waste.

In the Broach pergunnah, in the Ahmod pergunnah, and throughout the greater part of the Jumboseer pergunnah, the villages are substantial, and thickly located, being generally, found at a distance of two to two and half

miles from each other, and surrounded, as they always are, by clumps of fine trees, they give the appearance in the hot season of islands, in the midst of a desert or of the ocean ; an appearance still farther augmented, by the effect of refraction in those flat, and bare plains.

Ahmod. The residence of a Thakoor, is a town of about 4000 inhabitants, supported chiefly by agriculture : Miagong also the residence of a Thakoor, subject to His Highness the Guicwar, is a poor place, and probably, does not number 3000 people.

Jumbooseer. Is a Kusba of about 10,000 inhabitants, inhabited chiefly by merchants dealing in country produce, and agents for Malwa merchants, also many cultivators : here we have an extensive string of tanks, and a luxuriantly fertile, and highly inclosed country, so that the air, is for a part of the year, far from healthy.

The country from hence to Baroda is also rich, well inclosed, and thickly peopled. Each village has an extensive tank surrounded with a good deal of wet or marshy ground. Some of the villages as we approach Baroda are so large, as to merit the name of towns ; of these, I may mention Padra, and Darapore close to each other, and each containing about 7000 people, many of whom subsist by manufactures; and the rich garden soil in which they are situated, is portioned into a vast number of lots which afford employment to thousands more. Padra is a chief emporium for Assaftida, but why an inland place like this should be so, is more than I can say.

Baroda. The seat of His Highness the Guicwar's Government, and the station of our subsidiary force is an extensive, and rich town containing about 140,000

inhabitants; manufactures are few as compared with Surat, but the retainers of Government, their servants, and others who minister to their wants, and luxuries, form of themselves a large population. The city having no peculiar advantage of situation, and placed in the midst of a rich soil, and thickly enclosed country, has always its full share of the epidemics of a sickly season, more especially, as cleanliness is but little attended to in the thorough fares, and by-lanes, and the extensive brick drains constructed in better, and more liberal times, form now so many stagnant, and open receptacles of filth, of every description. Dogs, and Swine appear to be the only public scavengers.

I say nothing of Baroda camp, as that part of the subject is no doubt, in better hands than mine.

In the E. S. E. part of the Baroda districts, lies Duboy a town of about 25000 inhabitants, walled, well built, and containing a number of the most elaborate, and rich sculptures, to be found, on this side of India. The town contains very many houses of Bramins, a good many of weavers, and also numerous houses of merchants, and artificers, and a few of cultivators.

Champaneer. A mere skeleton bazar is all that remains, of this once splendid city. It is now very unhealthy during eight months of the year; ruins are found for many miles amidst the thickest jungle.

Sownkera, and Bahaduspore are now small places, but still important, in relation to the jungly districts near which, and in which, they are situated.

Godra. A border town, in one of the high roads to Malwa, formerly large, and well peopled, but now much decayed. Number of inhabitants about 14000.

In the Baroda districts generally, the villages are near to each other, seldom more than three miles apart, and often less, I speak of the centre of the district, for those situations up the rivers Nerbudda, and Myhee, are much more thinly peopled; the Grassias, Coolies, and Bheels are too near neighbours, and too much intermixed with the population near these rivers, and also on the Eastern side, of the districts, to allow the peaceable cultivators, to settle in any numbers.

Crossing the Myhee river, and getting beyond its broken ground, and the poor villages which occasionally are to be seen, immediately on its banks, we have in the Neriad, Napa, Boorsud, Petlad, and Oomrat pergunnahs, and all along, from thence to Cambay, below, and to Kupperwunje above, a country thickly studded with well built, and populous villages, many of them having 5000 inhabitants, and some more; also numerous, and wealthy towns peopled by traders, manufacturers, cultivators, and Bramins. Of the towns I may note Petlad of about 10000 inhabitants; Neriad the capital of the extensive tobacco districts, I would rate at about 40000 inhabitants: Boorsud about 10000. Oomrut 12000, Kuppurwunje 12000, many of whom are Boras. Dakore 6000; Kaira 12000; Moonda 9000; Mohmudabad 6000 Matur 7000; Dolka 25000; Cambay 20,000; Balasnore 8000; Tasrah 6000. Few of the villages throughout this district, number under 200 houses.

In most of these towns, cloth-printing, weaving, and dyeing employ probably the greatest number of people, and as there is generally, much garden, or irrigated ground in their immediate neighbourhood, a large population is supported, by its subdivision. The towns

are, most of them fortified, or have the remains of fortifications; which while they tend to protect them, against an outside population, not yet cured of marauding habits, do also materially obstruct the circulation of air, favor accumulations of filth, and in a sickly season, tend if not to increase greatly the mortality of any prevailing epidemic, at least to render its ratio (of mortality) much greater, than is the case, in the outside villages.

In this part of the province, the houses of all, excepting the poorest class of artificers, day-labourers, and such like, are of two stories, at the least, while those of the wealthier people are often raised to a height of four or five. Arriving on the Sauburmuttee, we find the city of Ahmedabad, formerly a splendid capital, and still important, as being the head quarters of the Northern division of the army, and of the Northern Zillah in the Civil Establishment; and hardly less so, as an eligible place of refuge, and depot of surplus funds, for Merchants, and Bankers, who carry on, extensive trade in the dominions of sundry Native princes in Guzerat. It is celebrated too, for the excellent quality, and durability of its cotton, silk, and brocade manufactures; population is probably 85000. There now remain to be noticed the towns, and general population North, North-east, and North-west of Ahmedabad.

The population is here less numerous than in the midland districts, the villages being generally, at distances of 4 or 5 miles from each other, and usually smaller than, and inferior in building, to those of the midland country. Many of them partially fortified, either with

walls, or thick, and secure hedges of the *Euphorbium Antiquorum.*

These villages contain few, or no weavers, or other artizans, saving those of the rudest kind; all the better sort of people of this kind, are here congregated in the larger towns, and hence these latter are numerous, and substantial. Towards the East is

Dehgong. A large agricultural town of about 8000 inhabitants. Paranty a Kusba town of about 9000 with very extensive tanks, abounding in fine fish.

Attersoomba a town of about 18000 belonging to the Scindian Chief, in the service of His Highness the Guicowar; Morassa a Kusba of 5500, Ahmednuggur a fortified town of 9000. Hursole of about 4000.

Crossing the Sauburmuttee, and to the N. W. lies Viemugam, now a flourishing town of 17000, inhabitants, though it be only of late years, that it has recovered from comparative desolation. Peitapore, and Maunsa each of about 7000 inhabitants, mostly Rajpoots, and Coolies; Moonjpore of a like size.

There too, is situated the shrine of Bechrajee, near which is a village, inhabited chiefly by eunuchs, and from whence the country is chiefly supplied with them.

Here resides their chief, or chief priest, as he styles himself, and to him are offerings made, from the various communities of eunuchs, to be found in other parts of Guzerat. Proceeding Northward, is Kuree a town picturesquely situated, in a finely wooded country, containing about 25000 inhabitants; many of whom are artificers, celebrated for their skill. Here too is the palace of the late Mulhar Row.

Next is the town of Bijapore, of about 12000 inha-

bitants, chiefly cultivators, and weavers, and at a distance of 16 miles is the town of Beesanuggur, of about 18000 inhabitants, many of whom are Bora traders, who export heavy goods, as iron, &c. from hence, to Marwar, and Mewar. There are here many weavers.

Burnuggur 12 miles distant, is a town of about 12000 inhabitants, many of them Nagur Bramins, who trade in gold; also many weavers, and other traders.

Farther on, on the Deesa road is Seedhpore eligibly situated on the Suruswuttee, and that being esteemed a sacred river, many wealthy Bramins, and Gosaens dwell here; of the latter there is an extensive, and richly endowed Mut'h or Collegiate Establishment, where instruction is given to disciples, and food, and lodging to travellers, and merchants of the same class. Weaving here is extensively carried on, and there are many Borah merchants. In the same zillah are several large towns, chiefly peopled by Koonbies, as Oonja of 15000 inhabitants.

Baloosna Munoj, and Nadajr, each of about 8000. Puttun the ancient capital of Guzerat, is farther West. It is still an extensive town, containing about 30000 inhabitants, and much weaving, and a good deal of silk weaving, is carried on. The town is also famous for its manufacture of swords, spears, &c. also for pottery of a very light, and beautiful kind, much sought for, all over the country.

Rhadunpore, situated close to the Run, a town of 15000 inhabitants chiefly cultivators, Robarees, or Graziers, Buneyas, a few artificers, and many Coolies. Its exports are chiefly of ghee, and skins. I ought to have mentioned in their proper place, the large towns

Kheyraloo, Pahlanpore, and Eder. The first is held by Scindian chiefs in the service of His Highness the Guicowar, and is rather a flourishing place, the land here being very rich; manufactures considerable; number of inhabitants about 12000.

Pahlunpore farther up and forming the capital of the border districts, being bounded on the North by the territory of the Marwar Raja of Sirohi. Pahlunpore is a town surrounded with a fine wall, and contains many artificers of different kinds; by these, by shopkeepers, and by followers of the Nuwab, or Dewan, is the population chiefly made up. Inhabitants probably 30,000.

Eder. Situated on the Hautmuttee; and bounding Guzerat, here, is an extensive, and fortified town; but the inhabitants chiefly Rajpoots,) are not remarkable for their industry. Their number amounts to about 10,000.

Roads and Communications. In a country so generally level as Guzerat, communication for half the year, is very easy, and carts traverse, from one end to the other; but as there are no made roads, communication is proportionably difficult in, and after the rains, especially, in the black soil districts, and indeed in the others, patches of black soil every where, now and then occur, of size, and softness quite sufficient, to render a road impassable, except in the dry season.

To the North of the Sauburmuttee, by avoiding the high road. travelling may be managed, at all seasons: I say this, because the high road generally, passes near to or through villages, where there is always a ready made deposit of soft mud dangerous for bullocks, and camels in the rains.

In the alluvial districts towards the sea, travelling even on horseback, is often hazardous, as early as September; much of the country, being overflowed, and a traveller, cannot always make sure, of avoiding the numerous tanks.

This incovenience is most particularly felt by invalids.

From the nature of the country, and the general absence of stone in the midland, and northern districts the construction of a substantial great road, would be a work of very great labor, and expense; but much might be done to facilitate travelling, were a line of great road marked out, and not allowed to be trenched on by any cultivator, and were the line led so, as to pass near, but not close to villages. At present the roads, such as they are, are frequently ploughed up during the rains, and are at all seasons obstructed, and cut across, by bunds, and open water courses.

The kind of carriage, most commonly in use, throughout the country is the cart. Bullocks (pack) are but little used, Camels not unfrequently, and Tatoos never. The Southern cart is a light, and commodious vehicle, originally built from a European model, and now universally in use, as far as the Nerbudda.

Beyond that river, a clumsy, heavy vehicle, wasting half the power of the draught in friction, is the only one used, both for commercial, and agricultural purposes. To the N. and N. E. of the Sauburmuttee, the carts are so large and heavy, that never less than four bullocks are yoked for road purposes, and for work in the fields, generally six.

Diseases incident to the inhabitants or to sojourners, and general remarks on the salubrity (compa-

rative) *of the various districts.* Of these, it is difficult to give a list which shall be exact, in their order of frequency, as different districts have in this respect, their own peculiarities. However I believe, we may say, that to the Southward, as well as throughout the whole province, fever is the disease most common, and in some seasons very fatal to the natives.

I have already alluded, to the extreme insalubrity of the Dang, or jungly district stretching from Darrumpore to Soneghur, and I believe, that as to the whole of the Attaveesy, it may be safely asserted, that a lengthened residence there, increases the liability to fever, and that, in the fevers of this quarter, the spleen becomes more early, and more decidedly affected, than is generally the case in the fevers, which prevail in the more Northern parts. The spleen enlargement appears to go on gradually, and may exist for months, before febrile symptoms are felt, though I must allow, that more generally the enlargement succeeds an attack of fever, and in the most jungly parts, when the fever does appear in a native, it seems more harrassing than violent, returning with various intensity, and at varying intervals, from the double quotidian to a seven day, or even fourteen day attack; and finally breaking down the system, altogether. In the whole of the jungle, of this Southern locality, we find, abundance of pabulum for Malaria, but the latter seems certainly, less active in districts, where, the soil approaches to red, than where, it is black. Thus at Durrumpore, the inhabitants will tell you that there is less fever, than at Bansda, where, the soil is chiefly black, though both places are much on a par, as to the abundance of jungle; again at Walor, where

there is no jungle, and where the town is situated on the high bank of a rocky river, with a quick flow, and no marshes are near, spleen disease is very common, and is followed by irregular attacks of fever. Here, the inhabitants universally, impute the disease, to the nature of the river water, poisoned as they term it, by the decayed vegetable matter of the inland jungles, and more especially, by the *Crinum Indicum,* a plant which grows plentifully, in the river, near the town.

The effects of this plant on water merit a careful investigation, as all plants of that family, are more, or less acrid, and poisonous. However it is very likely, that the cause first spoken of, is the chief one.

In this fevers of the Attaveesy, Dropsy is the most common sequela, and next to that Dysentery; with a general Scorbutic diathesis, anœmia, &c. I saw one case of a Parsi in this district, where the abdominal parietes had given way, at the umbilicus, from the extreme pressure of the water, and a temporary amendment took place, but the disease had again become as bad as ever, and a fresh rupture threatened.

Among the numerous Marwary, or Jain merchants of the Attaveesy, a chronic opthalmiæ with permanent engorgement of the conjunctiva, and with entropium, is extremely common. It appears to be altogether confined to this class of people here, and the other natives say, that it is so frequent among these Marwars, on account of the very large quantity of red pepper they use, with their food : very probably a fanciful idea.

I think, I have met with ten cases of this disease, among the Banians of Billamora, to one that I have met

with, in other places. Hereditary predisposition may have something, to do with it.

Among the Parsis of this district, head diseases, and chronic visceral affections (the consequence of indulgence in heating diet, and spirits) are very common. With them, blood-letting is a very favourite remedy, and they always insist on having the operation repeated on the second day after the first blood-letting. The moderate toddy-drinkers of this district (and they are numerous) do not appear to suffer in health, but are generally sleek and strong. The fishermen consume it largely, and they are a healthy race; among them, cutaneous diseases are the most common. Lepra of the worst kind is rather common, among the lower classes to the Southward, considerably more so, than in the Northern districts.

Among the Bramins, and others in easy circumstances, on account of their sedentary habits, and the nature of their diet, the fibre is extremely lax, and this laxity tends doubtless to predispose them to Hydrocele, which is more common in Surat, and the Attaveesy generally, than I have seen it any where else. Surat is at times very sickly, and the mortality great. On the whole, in the Attaveesy the safest places for locating European troops, (were it to happen that the exigencies of the service required such a location) would I think be found in the neighbourhood of Chickly, or between the Hill of Parnera, and the sea. And here, let me say a word as to the most eligible time for passing troops through the jungles, at the back of the province, as here lies the high road from Guzerat to the Deccan.

After November we hear little of fever in the open

country, but farther inland where the rapid drying of vegetable remains is prevented by the moisture of the climate itself, and by thickness of the jungle covering them, miasmata are perhaps generally more active in December, and January, than at an earlier period of the season; and in many seasons the jungles will not be found safe to traverse before February. The same remarks will apply to the other jungles, at the back part of the province generally.

The vicinity of Surat is proved to have been most unhealthy for European troops, partly from the climate, and partly also from the abundance of liquor procurable.

The climate between the Taptee, and Nerbudda, seems to bear a character much the same as to the South of, and about Surat. It has been remarked by many, and I can add my testimony to the fact, that a very bad and typhoid type of remittent fever is met with hereabouts. Hence it is vulgarly called the Kim Chokie, or red tongued fever; the latter name arises from a dry, and brick-dust coloured tongue forming a prominent, and always present symptom: the tpye is low remittent with dry skin, and early delirium. It is occasionally perhaps, rather than commonly met with, which is fortunate, as it is almost always fatal. I have seen the same type of fever only twice in other parts of Guzerat, and these occurred at Kaira, once in a detachment of Golundauze marching from Tunkaria to Deesa, in the hot season; the mortality among those affected was great.

The other case was a European of intemperate habits, and probably formed the sequel of a long debauch

on country liquor. It were to be wished that we had same more information collected regarding this form of fever. I know not why the locality of Kim, should be so peculiarly noted for it; there is no jungle there, and the surrounding cultivation is mostly dry.

The Wusravee jungle however is not distant more than twelve miles, and the Kim river has on its banks much broken ground. The water used here is chiefly, if not entirely, from wells. Towards the Nerbudda, and the Rajpeepla territory, and the cornelian mine districts, fever continues to be, by far the most prevalent disease, and here it is generally of the remitting jungle type. As we ascend the river, in Broach, and all along the Northern bank of the Nerbudda, fever continues to be the prominent disease, and in proportion as we ascend the river, and the country becomes more jungly; so does the enlarged spleen become more, and more common, as a symptom of fever, or cachectic febrile habit.

Receding from the Nerbudda, and amid the dry cultivation of the Broach, and Duboy districts, fevers do not prevail to any great extent, and I feel disposed to think from what I have seen that the whole of this extensive cotton district (keeping apart from the ravines of the rivers) is as healthy if not more so, than most other parts of Guzerat.

The worst parts, and those most to be avoided in stationing of troops, are the broken banks of the Nerbudda, and the swampy levels at the mouth of the Dadur river.

Amid the high hedgerows, and luxuriant vegetation of much of the Jumboseer pergunnah, fevers certainly prevail: but I do not think that on the whole the pergun-

nah is eminently insalubrious, though it be probably less healthy than the Broach pergunnah.

Baroda district. Being of most luxuriant vegetation, and generally thickly studded with rank, and water-fed hedges, fevers are common.

Fever prevails certainly among the natives to an extent, greater than is the case, either in the Broach, or Jumboseer pergunnahs, particularly in the extensive districts here allotted to garden cultivation in the immediate vicinity of which the camp is situated. Towards the Myhee, and up that river for a distance say of fourteen miles, there is more of dry unirrigated cultivation; the country is more open, and would probably be found more healthy for European troops, were a necessity to arise for their temporary location, hereabouts.

Of these Baroda districts the Eastern, and Northern parts of the Dhuboy pergunnah contain several very unhealthy localities, chiefly where rice is grown; the jungle is near, and from hence towards Sownkhera, Bahadurpore, Chandode, and Tullukwara, the insalubrity is still greater, and spleen disease is rapidly evolved in new residents; and of the fixed inhabitants not a few labour under it.

In the Champaneer and Pawanghur districts fevers of the worst description prevail.

North of the Myhee, fever continues to rank as the most common disease, but I do not think, that on the whole, it is so common among the natives, as is the case in the Southen districts, as about Surat; nor is it preceded or accompanied by spleen disease, to the same extent, as is the case in the more jungly districts. Judging from the appearance of the cultivators, and the in-

habitants in general, and the number of tall, well developed men we meet with throughout the whole country north of the Myhee, I cannot bring myself to believe that this climate is by any means so unfavourble to life as it is generally esteemed to be. The districts in particular, between the rivers Myhee, and Sauburmuttee have an evil reputation, and the unhealthiness of Kaira as a cantonment is proverbial. This idea of excessive and peculiar unhealthiness, has arisen from the very great mortality among the European troops formerly stationed there. Some have imagined that the unhealthiness of Kaira was increased in latter years, and that this increase was owing to the extension of rice cultivation in the neighbourhood of Camp; but I feel disposed to question the validity of this opinion, as well as the supposed fact which it attempts to account for. For example, gentlemen of the Civil Service residing mostly in the outskirts of the town, and in the immediate vicinity of rice cultivation, have never, to the best of my knowledge, suffered from fever in a greater, if in so great a ratio as the officers in camp; again in 1827 which was reckoned a sickly season even for Karia, out of twenty-seven officers, and civil servants who resided in, and near the town, and in the camp, six were affected with fever, and of these one died. At this time the men of the Horse Artillery, and the non-commissioned officers, as also the store, and commissariat conductors, all residing in the old camp, were almost to a man, down with fever.

Whence this great difference in predisposition. These were not liable to fatigue, or to exposure, they were troops lodged quite as well as, or better than their officers

in roomy,and well built barracks. The cause perhaps is rather to be sought for, in their excessive indulgence in arrack, and mhowa spirit. The latter in particular seems to have some specific power, in rendering the system liable to be acted on by slight doses of malaria, which would not affect a man in ordinary health, and the arrack particularly when new (as it too often is) seems to have the same effect.

The new or dragoon camp at Kaira, was generally esteemed to be more insalubrious than the old camp. There is propably reason in this idea: the locality does not seem to have been happily chosen. It is fronted at a distance of one and half miles to the South, by an extensive belt of swampy ground, and has the river with many broken ravines immediately in its rear; in front too there is at least one extensive tank. The mortality among the European soldiery was always great in this camp, even I believe in ordinary years, but I have generally heard it remarked, that those men who had from circumstances the greatest command of money, were most frequently, and fatally afflicted; a pretty convincing proof of the agency of liquor, as auxiliary to that of malaria. Farther as to this new camp; of the six cases of fever which I mentioned as having occurred among the European gentlemen in 1827, four occurred in persons residing in the new camp, and among them, the fatal case before alluded to.

I rather think that European soldiers stationed in any part of Guzerat South of the Suruswuttee, and having the opportunities for procuring country liquor, which every where in that locality, are to be found, would

suffer in ordinary years even just as much, as they did in the old camp at Kaira.

The localities in which they would have the fewest opportunities for excess, are probably those stretching from Kurry to the Run; all to the Eastward of the Sauburmuttee is "par excellence" the Mhowa district, and therefore most especially to be avoided if possible, even as a temporary station for European troops.

Ahmedabad. This city had formerly a reputation for salubrity, but the experience of later years does not seem to have borne this out.

Nor is this surprising, as all half ruined towns in a rich country, become so many nests of malaria; and I can easily imagine that this city in its former state of completeness, and grandeur, well supplied with pure acqueduct water, and having no ruins in its interior; and possessing as it does, great facilities for drainage natural, and artificial, may have been exempt from the invasion of autumnal malarious fever, to a degree, at present quite unknown in Guzerat. Here let me say that it were greatly to be wished that the levelling, and removal of ruins in this, and other great towns; the planting of belts of trees in eligible situations in the levelled, and vacant spots ought to from a principal part in the medical police of these towns, and the expense of such a measure would in all probability, be in a few years, more than repaid, by its results in the saving of population. At present on the occurrence of any bad season, fever commits much greater havock among the population of these great towns, than it does in the villages of the surrounding country.

Hursole. This station situated N. N. E. of Ah-

medabad, distant thirty-seven miles, gave when first formed high promise as a cantonment for native troops, and for the first five years succeeding to its location, it seemed to maintain the character with which it had started. It was supposed that as the black soil had been left at a distance, and cultivation universally dry succeeded to the partially dry cultivation of Kaira, the chances for health would be greatly increased. It was forgotten that the proximity of an extensive and surrounding jungle of the *Butea frondosa* (a tree at all times indicating suspicious localities) and the deeply broken country in the banks of the Meshwa might afford a pabulum, or seat for malaria quite as great, if not greater, than any which existed nearer to the sea.

I cannot speak positively as to the causes of the recent unhealthiness of the cantonment, as I have not visited it for some years, and it may be that under the late contracted circumstances of the station; the absence of pioneers, and other establishments requisite for keeping under the luxuriant jungle it may have become more unhealthy than it would otherwise have been, but I believe that without taking this latter element of opinion into account, we have in the first two causes, quite enough, to account for the sickness of 1834, and 1835.

The very deep ravines which abound here though possessing a dry, and even sandy soil, and seemingly not at all likely in ordinary seasons to generate malaria, may yet, in years when the rain falls particularly heavy (as was the case in 1834) become so many depots for the generation, and retention of malaria, and may retain this character for many months after the surrounding country shall have become healthy, and on this

account the neighbourhood of all ravinny ground, ought if possible to be avoided in forming a cantonment in Guzerat.

We have warning on this head in the case of Bratcha, Ruttunpore or new Kaira, Hursole, and others which I could name; unfortunately this possibility seldom exists, as nearly all of the Guzerat cantonments are partly for cavalry, and to this arm of the forces a river is essential. The vicinity of the ravines about Parantej has been found equally injurious, as at Hursole, to troops, who have happened to be encamped there for some time. In fixing on a place in Guzerat either for the temporary or the permanent location of troops, a plain as little broken as possible, should be selected, and ravines avoided in the greatest possible degree.

The vicinity of cultivation will in no respect injure the salubrity of a station, provided other circumstances be favourable. Such localities are mostly to be found from Kurry Westward, and as far as Deesa, and the Bunass river. The latter though a good deal broken in its banks in the immediate vicinity of Deesa cantonment, has the breaks so open, sandy, and exposed to currents of air, that they are not found to be a cause of insalubrity, and Deesa enjoys the reputation of being the most healthy station in Guzerat; though properly it is in Marwar.

To return from this long chapter on fever, to the general subject, viz. the diseases most prevalent among the natives of Guzerat.

Next to fever, rheumatism in its various, and Protean forms is the prevailing disease; it is met with most frequently in the districts adjacent to the jungle,

and the hills, and in towns, or villages situated on the banks of rivers.

Many cases of contracted limbs are met with, as a sequela of the disease, and not a few of nodes on the long bones, occurring in persons where there is not the slightest reason to suspect a venereal taint.

I am well aware that in Guzerat, as well as in India generally, a vast proportion of rheumatic cases are to be referred to a syphilitic origin, and this leads me to the

III. Head, viz. a disease extremely common, there being hardly a village, in which one or two persons (at least) may not be found affected with it. I allude to a rheumatic affection, accompanied by an herpetic, and intractable ulceration on the lower half of the forearm, and about the ankles.

The sufferers themselves do almost in every instance, impute the origin of the complaint to the abuse of mercury, given (as it almost always is) for the cure of venereal disease, and they always say, that the symptoms complained of, arise from the mercury working itself out of the system. It will generally be found to yield to the compound decoction of Sarsaparilla and Plummer's pill, with sometimes a few doses of the liquor arsenicalis.

The root of the *Asclepias Gigantea* better known under the name of "Mudar" or "Akra," is also a powerful means of cure.

IV. *Leprosy.* I use this term in preference to one strictly professional, because professional writers have very generally erred in their minute distinctions of the disease, and their phraseology on this subject, tends ra-

ther to confuse than to enlighten; a good example of what I mean will be found in the work of Dr. Good.

The disease is frequently met with in its varied, and always loathsome shapes. It is perhaps most common in the Southern parts of Guzerat. The elephant leg is occasionally though not frequently present; an approach to it may often be observed in excessive thickening about the ankle, and ball of the foot, in cases where the ears, alœ nasi, lips, and face in general are tumid, and tubercles exist on the scrotum. I can safely say that I have repeatedly seen all the symptoms of the disease from the simple "*leuce*" to the destructive inflammation of the extremities, and the swelled leg, all running into each other in such a way, as to leave in my mind, no doubt of their identity. For the cure of the disease, the natives seldom appear to use any means excepting occasionally large, and quite ineffectual doses of mercury.

The arsenical practice common in Malabar, and to the Eastward, they do not appear to know of, as applied to this disease.

V. *Dyspeptic Diseases* are common throughout the province, principally among the manufacturing classes, and other sedentary artificers: firing on the epigastrum, and back seem to be more commonly in use, than any other remedy; and too often the disease is aggravated by the injudicious use of mineral emetics as the Sulphate of Copper, a remedy, of which the native physicians are very fond. As a sequel of Dyspepsia I may mention a dryness of the feet, and palms with burning heat, and cracking of the skin. From this form of disease the cultivators suffer most. It generally yields most readily, to a course of alteratives, and gen-

tle friction of the parts affected, with the vegetable acids.

VI. *Dysentery and Diarrhœa.* I believe I have already remarked, that these diseases are met with more frequently, South of the Taptee, than to the North. In fact, to take the province as a whole, they cannot be said to be common complaints.

VII. *Syphilis and Gonorrhœa* are very common, and often ill-treated, so that strictures, urinary fistulæ, mercurio-venereal disease are continually meeting the eye in their most painful forms. I would say that the Musulman population are more generally affected with venereal complaints than the Hindoos appear to be.

VIII. *Cutaneous Diseases* are met with in proportions, not at all different from what is the case in other parts of the country, and therefore it is needless to notice them more particularly, but I may allude to one form of cutaneous, or at most, cellular disease said to be peculiar to Guzerat. I mean the Cambay or Broach boil, which begins as an indolent tubercle, and appears to extend first inwardly till it has reached the limits of the cellular texture, and afterwards laterally with unhealthy, cuppy ulcerations on a hard basis; most obstinate in resisting the action of the strongest remedies. I think the disease might be best referred, in affinity, to lupus.

It is said to be peculiar to the districts of Cambay, and Broach, but appears equally to prevail throughout the country adjacent.

There are sundry nostrum venders who profess to cure it by plasters composed of orpiment, and the white oxide of arsenic, followed by applications of the warm-

er gums. They are often successful, and when they are so, the boil, or boils are thrown off as a compact mass of diseased, and infiltrated cellular substance. During the cure, distressing, and often dangerous symptoms arise. Sometimes to such a degree as to threaten life. I have seen a course of the *mudra* very useful in aiding a milder cure by local means.

IX. *Dracunculus.* Is not a very common disease in Guzerat. In the Baroda, Kaira, and Jumboseer districts it is occasionally met with. One well, somewhere on the road between Tunkaria Bunder, and Baroda, is said to have a peculiar power of producing the disease in those who drink of its waters. I have not had an opportunity of verifying this assertion, but recommend it to the attention of those who may have.

X. *Scrofula* is frequently met with, most generally in the form of cervical tumours, frequently in children, as affecting the mesenteric glands, and the eyes; less commonly attacking the lungs. I think the disease is greatly more common in the Southern than in the Northern part of the province.

XI. *Diseases of the Eye.* Common. To the North, the external structure of the eye seems most often affected, and in the South, and midland districts, Cataract, and Amaurosis are probably more common. I believe I have already alluded to Nyctalopia as being of very common occurrence in damp and jungly localities.

XII. *Variola or Small-Pox.* Carries off annually many persons, particularly in the more remote, and unfrequented districts out of the line of the great roads, or at a distance from large towns. I believe that in the midland country, beginning at Surat, and ending at

Ahmedabad, in the whole of which range vaccination is thankfully received, and often eagerly sought after ; the frequency of Variola has been greatly lessened, and the results appear evident in the increase of population.* The same disease is at times very fatal among the cattle ; they become so weak and feverish as to be unable to eat in consequence of the effect of the pustutar eruption on the lips, tongue, and throat.

Before concluding I may be permitted to add a few words as to the choice of a *sanatarium* for European officers, and soldiers suffering from fever in Guzerat: various situations have been tried, but as yet in vain.

There was a convalescent hospital in the vicinity of Cambay, but being found useless it was soon abandoned.

Next, a site was chosen near to Dehwan on the Myhee river, on a commanding spot, just over the high, and precipitous bank of the river, where the soil too was comparatively dry, and sandy, open to the Southerly, Westerly, and Northerly winds; unfortunately in this neighbourhood, are many ravines, and possibly from the effect of these, and the exhalations from the subjacent river, the situation was most insalubrious. In fact hospital attendants who accompanied sick soldiers thither, got fever in a much greater proportion than they did at Kaira, and therefore this place too, was soon abandoned, and as the strength of European Infantry was afterwards removed to Deesa, no other convalescent establishment has to the best of my knowledge been since formed.

The Hill of Aboo in Northern Guzerat in height about 5000 feet, has been talked of, and probably been pro-

* V. Appendix.

posed, but independent of the difficulty of access to Aboo being so great as to render it inapplicable to general public purposes, and of its distance from the more central parts of the province, it seems very doubtful, whether the top of the hill does not abound in malaria, for half the year.

The Hill of Pawanghur near Baroda has also been proposed. Its height, isolated situation, excellent water, and the delightful prospect which it commands might recommend it, but the table of the hill composed of disintegrated trap, and porphyritic rock, now formed into a rich black, or greyish mould, seems like all soil of the kind very retentive of moisture, and even at the time I visited it so late in the season as March 23d the table of the hill had in many parts the appearance of having been recently dried up, and abounded in cracks; moreover the height of the hill above the surrounding highly pestilential district is not sufficient, to warrant our believing, that it would be out of the influence of the miasmata below. One side of the hill is covered with jungle; on the whole I am of opinion that it would be rash to go to any expense in making a sanatarium here, even if the cession of the hill from Scindia's Government could be obtained, a thing not very likely.

There exist on the hill, remains of Jain colleges, and temples, which might be turned to good account in building.

Perim Island. Situated in the gulf of Cambay, opposite to the sea port of Gogo; and distant from the main land, not more than seven miles, has been thought of, as a place for a sanatarium. The soil of the island I believe to be good, but I apprehend that it is altogether

toomuch land locked and exposed to breezes blowing over the adjacent districts, to allow of its freedom from malarious influence.

Domus A naval station in the territory of the Sucheen Nuwab, and situated at the mouth of the Taptee is much resorted to by convalescents, and fever patients from Baroda, Broach and Surat, and as it is encompassed, or at least peninsulated by the sea; indeed it is at spring tides wholly insulated, and backed by a bare salt plain of moderately luxuriant vegetation, it enjoys a milder temperature, and much greater freedom from malaria, than most other places on this coast. Its remote situation however, relatively to midland Northern Guzerat, and the difficulty of access to it at seasons in which its beneficial effects are most required, forbid the idea of its ever becoming a convalescent station of general resort, unless it were to happen that a road passable at all seasons of the year, were to be made through Guzerat. Another cause which at present operates very greatly to the disadvantage of Domus as a station of resort is the very great difficulty of procuring accommodation there, and there is no shade for tents. A very slight expense, certainly not exceeding 7000 Rupees, which would be incurred in transporting the materials of, to and erecting at Domus, one of the excellent barracks at Bratcha, would in all probability be repaid to Government within the first four years, while the accommodation which such a measure would afford to sick officers from Kaira, Baroda, Broach and Surat would be beyond measure great.

Let me hope that this suggestion may be listened to. It would cheer many a despairing spirit at the season of

sickness, and would render the return of officers to their various corps, and departments much more speedy than can now be the case. Besides many officers are from collateral circumstances unable to visit the Presidency at the time of sickness, and to all such Domus would offer a double advantage.

I know of no other place in the whole of Guzerat (excepting probably Vaux's Tomb on the opposite side of the Taptee) where a sanatarium could be established with the slightest chance of benefit. The neighbourhood of Vaux's Tomb is probably quite as eligible a situation as Domus, nay if any thing more exposed to the Southern, and sea breeze than Domus is; but owing to the creeky nature of the intervening country, communication with Surat is difficult, and the want of a village near the tomb is an important drawback.

At present Cambay is the point for which the many invalids of Guzerat make, or try to make in a sickly season.

But at the very period at which fevers are most prevalent, much of the country can be passed through, only with the greatest difficulty, and at a rate of expense generally quite beyond the means of a sick Subaltern, and even if he does reach Cambay, to wait for the opening of the port after the 15th October, he has still during his season of expectation, to contend with much malarious influence. I have often heard, but cannot speak from personal experience on the subject, that invalids from Guzerat recover more rapidly, and more certainly in the pure sea air, and comparatively dry soil of Poorbunder on the S. W. Coast of Kattiawar, than they do in Bombay. Were it possible to construct a road lead-

ing from Ahmedabad or Kaira to Poorbunder, a distance of one hundred and ninety miles, a sick person might with ease be transported within the reach of pure sea air, in a very short time.

This road would possess a great advantage in being readily accessible from five stations in central Guzerat, viz. Kaira, Hursole, Ahmedabad, Broach and Baroda. My only inducement for throwing out this rather visionary hint is, that I know of no other possible mode by which a beneficial change of air could be secured to officers in the Northern districts of Guzerat, labouring under fever, at a time when such a change is most urgently called for.

APPENDIX.

Some remarks which have been omitted in the body of the foregoing paper may appropriately find a place here.

1st. To the list of diseases I ought to have added "Coup de Soleil" or Insolation, an affection, as I before remarked, by no means uncommon to the natives themselves, and particularly fatal to the European soldier in certain seasons. The natives know it under the name *Look* or *Loo*, and dread it extremely, and carefully provide against it by enveloping the whole head, and neck in thick folds of cloth, at the hottest season.

As a remedy when the disease has seized on a person, they use constant, and long continued frictions of the palms, calves and soles of the feet, with Duhee or curdled milk, and sometimes with lime juice, giving at the same time a little gentle stimulus, inwardly.

The same practice I find prevails in Turkey, and Asia Minor. It is worthy of a trial, particularly as we seem yet, to have no other remedy of the least use in the disease.

The lancet has been used at Cawnpore and Allahabad with positive injury, and I have likewise found it useless if not hurtful in European soldiers attacked in the same way at Kaira. I can bear testimony to the good effects of the other practice in one case, viz. my own.

After one and half hour's friction, the burning dry skin, intense headache, and confusion of ideas were relieved by the advent of a copious sweat : therefore I deem the practice to be worthy of a farther trial.

II. In the list of plants I have mentioned the *Cucumis Colocynthis* which grows abundantly on the sandy downs near

the mouth of the Taptee, and may yet become a product of some importance; another species (I believe undescribed) is also collected by the Parsi Veyds of the Southern districts, and stored up for use as a purgative.

III. I ought to have mentioned in its proper place the hot spring of Oonye; situated in the jungle between Bansda, and Boharee. The water arising from primitive strata appears to contain only Carbonic acid.

General temperature of the spring 120° to 124°. An extraordinary circumstance attending this spring is, it is asserted, that once a year, and only once, viz. during some part of the springs, of the full moon in April, the water becomes so cool, as to admit of persons bathing in it, and accordingly at this season there is a far famed Jattra at the spring, and people crowd in immense numbers to bathe. It is very probable that at other seasons of the year, the temperature may be lowered, but the Bramins universally assert that it is only for a part of the three days in April. The place is sequestered, and the neighbourhood unhealthy, so that it is not likely that any one would reside there for a time sufficient to allow of his observing accurately, the variations in temperature: at the same time the subject is extremely curious, perhaps important.

By the kindness of my talented friend J. S. Law, Esq. Civil Service, I was favoured with a register of the thermometer, as it stood at the Jattra time. I here subjoin it, trusting that Mr. Law will pardon the liberty I have taken.

April 23. Full Moon. ½ past 5 A. M. Large Bath, 105°; Small Bath, 116°.
1 P. M. Large Bath, 103°; Small Bath, 118°.
10 P. M. Large Bath, 78°; Small Bath, 94°.
April 24. 5 A. M. Large Bath, 113°; Small Bath, 119°.
½ past 1 P. M. Large Bath, 107°; Small Bath, 120°.
5 P. M. Large Bath, 113°; Small Bath, 124°.
April 25. 5 A. M. Large Bath, 110°; Small Bath, 122°.
6 P. M. Large Bath, 113°; Small Bath, 124°.

When I visited the spring in March of the same year, I had not an opportunity of ascertaining the temperature then, as I

had broken my thermometer. I was able to immerse my finger half an inch beyond the second joint, speedily withdrawing it.

Here, in conclusion, let me state, I doubt not but that numerous inaccuracies may be found in the foregoing paper. These will probably meet the eye of persons qualified to correct them, and it will give me pleasure to see the cause of truth advanced by such corrections.

Si quid novisti rectius istis, candidus imperti, si non, his utere mecum.

AHMEDNUGGUR, 22d August, 1836.

OBSERVATIONS

ON

THE CLIMATE

OF THE

MAHABULESHWUR HILLS,

BY J. MURRAY, ESQ.

Presented November 13th, 1836.

The recent establishment of convalescent stations on some of the more elevated and temperate table lands within the limits of the different Indian Presidencies, forms an important epoch in the history of medical police in this country. Vague and imperfect as our knowledge of the laws of meteorology confessedly is, it is not to be wondered that erroneous estimates should at first have been formed, and that some degree of misconception should even still exist, in regard to the true nature and practical application of these inter-tropical mountain climates. In testing their merits, we have been too much in the habit of looking at them through the medium of their abstract temperature alone, without keeping sufficiently in view, the physical causes upon which their temperature depends. Sufficient attention, it will probably be admitted, has not hitherto been paid

to the increased rarefaction, and diminished pressure of their incumbent atmosphere, or to the modifying effects of their local elevation upon solar radiation. And yet without a due regard to these distinctive characters of their climate, and to the important influence which is thereby exerted upon the general vascular system, as well as upon cutaneous secretion and the respiratory function of the lungs, it must be obvious that our opinions regarding their nature and effects must be imperfect, and in many cases altogether erroneous.*

Notwithstanding the differences which exist, however, between the physical constitution of the climate of these hill stations, and that of countries of corresponding temperature in either of the temperate zones, I am nevertheless of opinion, that, tried by their own intrinsic

* In apparent forgetfulness of the modifying circumstances of diminished atmospheric pressure, increased solar radiation, &c. we find it stated by a medical authority of considerable experience in hill climates (Baikie's Observations on the Neilgherries, p. 52) that "we are bound to anticipate as good effects from the climate of the Neilgherries as from that of Great Britain, provided we make allowance for the countervailing effects of the suddenness of the transition." This opinion, which is opposed to theoretical reasoning, has been refuted by experience. There is nothing more likely to bring the Indian hill stations into disrepute, and to deprive them of the reputation, they now deservedly enjoy, than an over estimate of the merits of their climates. It is calculated to convey an erroneous impression of their qualities, and consequently to raise expectations which must eventually be disappointed. In regard to *temperature*, the Neilgherry climate approximates to that of England, and the Mahabuleshwur Hills correspond still more closely with the Cape of Good Hope; but it were a grave error to suppose, that, in point of medical qualities, either the one mountain station or the other is equal to its isothermal climate in the temperate zone.

merits, they are calculated, by a judicious application, to form very useful auxiliary agents in a great proportion of functional disorders, and in some of the slighter forms of chronic disease which come under treatment in this country; and that their establishment may therefore be considered as one of the most important boons which has been conferred by the Indian Governments on their European subjects.

The object of the following observations is to present a brief outline of the climate of the Mahabuleshwur Hills, which form the site of the Bombay convalescent station. After premising such topographical details as have a more immediate reference to the subject of this paper, I shall consider in succession the physical characters of the climate, its influence on the human constitution in a state of health, and the probable value of its agency in the treatment of disease.

The Mahabuleshwur Hills form part of that extensive chain of mountains known under the name of the Western Ghats, which stretch from the province of Candeish to Cape Comorin, in a line nearly parallel with the coast. They take their name from the small Brahmin village of Mahabuleshwur,* which is situated at the northern extremity of the table land, and is of reputed sanctity from its position at the source of the "holy Kristna." Their situation in relation to the circumjacent country, may be considered to be in a great measure insulated. The narrow valley of the Kristna forms their northern boundary, and leaves only a narrow neck of land to

* The derivation of Mahabuleshwur is obviously from the three Mahratta words *maha*, *bul*, and *ceshwur*, signifying "the God of great power."

connect them with the general range in that quarter, and at their southern extremity the hill takes a sudden bend to the south-east, and narrows to a considerable extent their continuity with the southern part of the chain. On their western side they rise with an abrupt and precipitous ascent from the Concan, which separates them from the sea by a belt of land, from twenty-five to thirty miles in breadth; while their eastern face presents a somewhat less rapid and steep descent into the table land of the Deccan. Though the boundaries of the station are thus strongly marked, and distinctly defined, it varies considerably as to length and breath, in consequence of lateral ramifications, which branch off at different points. Its greatest breadth at the northern extremity is about fifteen miles, and about eight at its southern boundary. The average direct length North and South does not exceed five miles, though from N. E. to S. W. it extends diagonally seventeen miles.

The site selected for the position of the sanatarium is in 17° 56′ North latitude, and in longitude 73° 30′ East, being distant twenty-five miles due East from the sea, and sixty-nine miles direct distance from Bombay, which bears N. 29°. W. The situation is a favorable one on the seaward, or western slope near the edge of the mountain, and is consequently freely exposed to the influence of the sea breezes, while it is to a certain extent protected against the force of the easterly winds. On the spot, also, has arisen a new village, which the Rajah of Sattara (to whom it originally belonged) appropriately named *Malcolm Peth*, in honor

of the late Sir John Malcolm, the distinguished founder of the station.*

The general elevation of the station has been ascertained, by a series of barometrical observations conducted by Mr. Walker, to be 4500 feet above the level of the sea, while its highest summit attains an altitude of 4700 feet. It is elevated upwards of 4000 feet above the subjacent country on the Concan side, and more than 2000 feet above the level of the Deccan, at its eastern base. The surface of the station is generally undulating, and in some parts hilly; but it is in many places practicable for wheeled carrages.

The soil consists principally of a red clay, formed by the disintegration of the cellular ferruginous clay stone, which here constitutes the surface rock, and overlies the secondary trap formation. This rock occurs, most generally, in superficial or detached masses, whose outer surface becomes hardened, and blackened by oxidation from exposure to the air. When first quarried it is comparatively soft, and of a brick-red colour, intermixed with lighter coloured streaks. From the facility with which it is hewn, and from its quality of hardening by exposure, it forms an excellent and cheap material for building purposes: but, from its cellular structure, requires to be protected by tatties during the rainy season. It contains a considerable impregnation of iron, and is advantageously smelted for that purpose.

The laterite soil formed from this rock, though scanty on the summits of the rising grounds, is, in the lower

* "Here," observes His Highness in his Proclamation, dated December 1828, "there shall be a Petah; and it shall be called *Malcolm Peth*; and it shall be protected; and it shall flourish."

levels, intermixed with the debris of trap rock, and in some places with a considerable proportion of decayed vegetable matter, forming a brown mould, which is found to be abundantly productive. The soil, after a few days exposure to heavy rain, becomes tenacious, and this allows a great proportion of the subsequent water to run off; an effect which is greatly promoted by the undulating nature of the ground. It never at any time becomes muddy; nor is there any where on the hill the slightest appearance of a swamp or marsh.

An abundant supply of excellent water is at all seasons procurable either from wells, or from the small streamlets, which traverse the hills in various directions, several of which retain their water during the whole of the hot season. It is generally to be reached by digging to a depth of from ten to forty feet.

Very little cultivation exists as yet at this station, there being only a few small patches of ploughed ground, on which are grown the common grains of the Deccan. Within the last two years, however, there has been a very considerable increase of the cultivation of potatoes, which are found to be of finer quality than any that have been produced elsewhere in Western India. A plentiful supply of all the common culinary vegetables of the best description can be procured at reasonable rates.

It does not fall within my present purpose to enter into any detailed description of the botany of the station: it will be sufficient to indicate its principal features. *

The general absence of forest trees gives, at first sight, an appearance of bareness to the table land of the

* For much information connected with the Botany of this Station, I am indebted to my friend Mr. Graham.

hills. A few groups and avenues of fine trees decorate some portions of the main road, the line of which they follow with so much regularity as to convey the impression of their having been planted for the express purpose of shade and ornament. They consist principally of the *Calyptranthes caryophyllifolia* (Jamboo!), by far the commonest tree all over the table land; the *Memecylon ramiflorum* (Arjun), which looks very beautiful at all seasons, with its small polished dark green leaves, but particularly so from February till April, when its numerous blue and purple flowers appear through the foliage, clustering round the naked branches; the Peesah, a species of *Tetranthera*, flowering in November, and bearing a small acorn looking berry, half enclosed in the calyx, and contrasting strongly in its light coloured foliage with all the other trees; the *Olea dioica* (Par. Jamb.) the *Terminalia chebula* (Heerda), the *Symplocos racemosa*, an erect growing tree with large leaves of a thick, firm texture, and almond-scented flowers; and the *Ficus glomerata* (Oomber) or water tree of the Natives, growing almost to as large a size as it does in the low rich lands of the Concan.

Of the rarer trees and shrubs may be mentioned, *Fagara triphylla*, hitherto not noticed by any botanist as a native of the Peninsula, the *Pittosporum floribundum*, the *Eriochlena Hookeriana*, *Pygeum acuminatum;* a *Salix*, perhaps the *tetrasperma* of Roxburgh, a species of *Elaeocarpus*, *Urtica pulcherrima* *Rubus rugosus*, and *Cupia thyrsoides*.

In addition to those already enumerated may be noticed the *Pentaptera tomentosa* (Ain), and *paniculata* (Keenjora), a species of *Conocarpus* (Daura), the

Mango tree, some species of *Bignonia* and *Bauhinia*, the *Briedelia montana* (Asana), &c. These are chiefly to be found in ravines and sheltered situations on the western face of the Hills.

The copse which in some parts is very thick, consists of the *Gardenia montana* (Ghela.) It attains a considerable size in sheltered situations, but is generally found in the form of a scraggy bush. Its pale yellow flowers begin to appear in April, and possess, like most of the family, a considerable fragrance. The fruit much resembles a crab apple, and hangs on the bushes till the flowering time of the succeeding year—the *Baeobotrys indica* (Atkee), the *Solanum giganteum* (Chunna), the *Eleagnus conferta* (Amgool), *Colebrookia tarnifolia* (Bhamnee), *Flacourtia sepiaria* (Tamboot), the *Callicarpa lanata* (Eisur), *Pavetta indica* (Paput), *Scutia indica* (Chimtee), *Ziziphus rugosa* (Toorun), *Limonia monophylla*, a species of *Celastrus* (Yenkul), a shrub called *kala goora*, the *Karwah*, so commonly used in wattled buildings, a species of *Bradleia* called *Bhoma* by the natives, and an *Osyris* (Lotul).

Of climbing plants may be noticed the *Abut*, figured by Rheede in the Hortus Malabericus under the name of *Pu-Valli*, but which does not yet appear to have found its way into any systematic work. It flowers in December and is very common—the *Embilia robusta* (karkunie), *Josminum latifolium* (koosur), and *Hoya viridiflora*.

With the exception of the *Karwah* and *Gardenia*, none of the above are at all remarkable for the beauty of their flowers. The only truly ornamental shrubs are the *Gnidia eriocephala* (Rameta), and the Dingala,

a species of *Crotularia*. Both are very common and add greatly to the beauty of the landscape when in flower; the latter particularly, covered with its abundant light yellow blossoms, presents at a distance a considerable resemblance to the "long yellow broom." A shrubby species of *Indigofera*, called Neerda, also deserves to be put in this class, and the *Clematis gouriana*, and *grata*.

The most striking feature in the vegetation, is the profusion of the common Brake, *Pteris aquilina*. It is most abundant every where, rises in some places to the height of nine or ten feet, and serves to recall the endearing associations of a more northern clime. A very beautiful species of *Osmunda* abounds in the vale of the Yena and other damp situations.

A considerable numberand variety of annual and other plants spring up in succession during the greater part of the year. Of these a species of *Curcuma*, probably the *montana* of Roxburgh appears in the greatest abundance every where, at the commencement of the rains. From its roots, an excellent description of Arrow root is procured. The beautiful *Amaryllis insignis*, the snake lily (a species of *Arum*), the *Curculigo brevifolia*, *Exacum bicolor*, *Plader avirgata*, a species of *Phlomis*, and a plant with yellow flowers resembling a *Conyza*, are also common.

There is a considerable variety of parasitic *Orchidiæ* some of which possess great beauty. Two or three species of *Loranthus*, the *Vicum Wighteanum*, and *compressum* (Indian Misletoe), and *Cuscuta reflexa* are also commonly met with.

The trunks and branches of many of the trees are

covered with a variety of *Lichens* and *Musci*, and as the botany of the hills has only been partially and imperfectly examined, it is probable some of them may be new to science.

Although only eight years have elapsed since the establishment of this station, the hills are already intersected by excellent roads in every direction, for which we are indebted partly to the liberality of the Rajah of Sattara, but principally to the munificent contribution of the numerous visiters who have during this period resorted to the station. These roads, which now extend over a space exceeding forty miles, while they afford to the invalid the means of varying and prolonging his rides, open up to him at every point, a varied succession of mountain scenery, which for grandeur and beauty is scarcely to be equalled in any part of the world, and which constitutes by no means the least attractive feature of the station. It would lead us too far from our subject, were we to attempt a description of these different scenes The more than alpine grandeur of the scenery around Elphinstone and Sydney Points, the picturesque fall of the Yena, and the exquisite beauty of prospect from the several headlands which overlook the Tamb valley, will at once occur to the memory of every one who has had an opportunity of visiting them.

The only topographical point which remains to be noticed, and the one which admits of the benefits of the station being so extensively diffused, is its accessibility and its proximity to Bombay, and to the principal stations of the Deccan and Concan. Thus the invalid from Bombay, by sailing down the Coast to Bancoote,

and thence up the Sawitree river to Mhar, (a distance of seventy miles by sea and thirty by river,) is brought within twenty-seven miles of the Hills; or, should he object to even this short sea trip, he can cross the harbour to Nagotna, (which is effected in one tide,) from which the distance by land is only seventy miles, along an excellent road, with a public bungalow at each stage. The distance from Poona by an indifferent hilly route is seventy miles,* and from Sattara only thirty miles by a very good carriage road.

It is very important to remark, that the approach both from the Concan and from the Deccan side is at all times safe, as there is no intervening jungle, and no danger to be apprehended from attacks of fever, or other diseases of malarious origin.

I am not aware of any disease which is endemic to the station. During a period of eight years, only five cases of sporadic fever have occurred (so far as I know) four of which were distinctly traced to cold as their exciting cause. In their leading features they resembled the common congestive, remittent fever of the Deccan; and in all of them cerebral excitement was the prominent topical symptom. A few solitary cases of cholera, not exceeding four or five in number, and affecting only natives, appeared at this station in 1830, when it was prevailing epidemically in the adjacent low country. In no instance, however, was any one attacked who had not arrived from the neighbouring parts of the Concan and Deccan (where the disease was then pre-

* When the road now in progress between Poona and Satara shall have been completed, it is probable that the generality of visitors will prefer that route to the more direct line by Wye.

valent) within a few days of his seizure ; * nor did it, in a single instance, spread to any one of the permanent residents. From these facts, we are naturally led to the inference that, in the detached cases alluded to, the disease was communicated in the plains, and remained for some days latent in the system.

Climate. With this brief outline of the topography of the station, I proceed to the consideration of the more immediate subject of this paper.

In tracing the physical characters of the climate through the different months, it will be convenient to divide the year into three seasons, the *cold*, the *hot*, and the *rainy* seasons. As the transition from one season to another is generally gradual, and their respective duration varies somewhat in different years, it is impossible to define the precise limits of each with perfect accuracy. Instead of adopting the more uniform and customary division into three seasons of four months each, (a division which generally holds good on the plains,) it will comport better with the usual distribution of temperature here, to assign five months to the *cold*, three months to the *hot*, and four months to the *rainy* season. Under this arrangement, the cold season will embrace the months of *October*, *November*, *December*, *January*, and *February;* the hot season will include *March*, *April*, and *May;* and the rainy season will comprise the remaining months of *June*, *July*, *August*, and *September*.

The remarks which follow are founded on a series of

* The longest interval occurred in the case of one of the Raja of Sattara's camp followers, who was not seized until the tenth day after his arrival.

meteorological registers which have been carried on without interruption for eight consecutive years, and form an aggregate of upwards of ten thousand thermometrical observations.* The mean results of temperature are deduced from observations made at the two periods of greatest cold and heat. The hours when these two daily extremes are indicated will be more particularly noticed hereafter. The temperatures are taken from thermometers suspended out of doors in a verandah which is protected from the direct influence of the solar rays by a thatched roof, but is freely exposed to the open air on the northern side, without the intervention of venetian or other skreen. The degree of atmospheric humidity has been ascertained by wrapping the bulb and lower part of the stem of a thermometer in muslin, and, having wetted the covered bulb with spring water, by observing (as compared with a dry naked thermometer placed side by side in the shade) the amount of depression arising from the cold produced by evaporation. These hygrometrical observations have only been recorded for two years.

The commencement of October may be considered as the connecting link between the rainy and cold seasons. The weather during this month combines the good qualities of the climate of both seasons, and is altogether the most genial and pleasant throughout the year. The temperature is cool and equable, and there is an agreeable freshness in the air, which is not experi-

* For the meteorological registers of 1829 and 1830 I am indebted to Mr. Walker, and for those of 1834 and 1835 to Dr. Morehead. The observations for 1831, 1832, 1833, and 1836, were made by the writer of this paper.

enced in the same degree at any other period. It reminds the visitor of an European spring, and forms a pleasing, and striking contrast with the oppressive weather experienced at this period on the plains, and more especially on the coast. During the early part of the month, there is an agreeable alternation of cloud and sunshine through the day, with light transient mists and fogs, and occasional passing showers in the afternoon, and early part of the evening, succeeded by clear and serene nights. The winds are at this time somewhat variable; but are most frequently easterly, veering round to the westward in the evening. As the month advances, the weather gradually assumes the more steady and characteristic type of the cold season.

The Hills, in October, are clothed with verdure, amid which the variegated flowers of the *Curcuma*, and the waving yellow blossoms of the *Crotularia*, hold in succession the most prominent place. These in their turn give place to the *Gnidia eriocephala*, which continues in flower during the remainder of the cold season. The scenery, too, is rendered peculiarly attractive by the mingled lights and shadows of the mists, which at times flit fitfully across the mountain, now rest in low patches on the vallies, and anon girdle the sides of the mountain ridges with their silvery vapour.

This is the most advantageous period for the invalid to repair to the Hills, when circumstances admit of a choice. It is essentially requisite, however, to have fires in the bungalow for some days previously to its being occupied, in order that all the apartments may be thoroughly dried and ventilated.

During the months of November December, Janu-

ary, and February, the sky is almost uniformly clear, and the atmosphere dry, cold, bracing, and elastic, with a steady and limited range of temperature. The atmospheric currents are singularly uniform in their direction, force, and duration. During the night and morning, a sharp, steady, easterly wind usually prevails, which, towards mid-day, gradually abates in strength, and veers round to the northward, whence a light breeze continues to blow during the remainder of the day. In the latter part of January, there is a gradual approach to the alternation of land and sea breezes, which become more regular and decided in February, and impart an agreeable softness and mildness to the atmosphere. There is a pretty constant deposition of dew in the early part of the season, in states of the weather favourable to its formation. Occasionally in still, clear nights the cold is sufficiently great to freeze the dew as it is condensed; and on such occasions hoar frost will be observed, on the fibres of short grass, in the vallies.

Occasional changes of weather are of course to be expected in the course of the season; and they usually occur about the period of the new or full moon. These changes generally consist either in the occurrence of a close and sultry state of the atmosphere, continuing for two or tree days, with calms or light southerly airs, accompanied occasionally with distant thunder, and perhaps with one or two showers of rain; or there is an increase in the force of the East wind, which sometimes blows with considerable strength for two or three successive nights, or, more rarely, throughout the twenty-four hours. Although the easterly winds on such oc-

casions are keen and somewhat piercing, the cold is never rigorous.

The clemency of the weather, indeed, even in the coldest months, is one of the most remarkable features of the climate. It is a fact, for which I am unable to find a satisfactory explanation, that at places upwards of two thousand feet lower than this station, and at a distance of not more than twenty or thirty miles, the thermometer occasionally sustains a greater depression by several degrees, than has ever been observed here. Fires are not absolutely required during the day, but are indispensably necessary for comfort in the evenings throughout the cold season.

The atmosphere during these months is generally clear and transparent. Hence the adjacent mountains appear much nearer to the observer, and their features more distinct, than at any other time ; and ships sailing near the Coast (and occasionally boats) can frequently be distinguished with the naked eye. In October and November, (and again in the latter months of the hot season,) a dense horizontal stratum of mist is often at day-light spread out over the Concan, which it completely shrouds with its fleecy mantle, until dissipated by the beams of the rising sun, when the peaks of the hills are observed, gradually to emerge from under their vapoury covering, like islets from the ocean. These mists are usually seen on such nights as are favourable to the deposition of dew; but what that modification of atmosphere is, which (in the absence of any considerable body of water) at one time, and in one locality, gives rise to the formation of mist, and at another to

the deposition of dew, meteorology does not yet enable us fully to explain. *

The mean temperature of the cold season is 64° 08′, with a mean daily variation of 11° 72′ ; the mean maximum heat being 69° 95′ while the mean minimum is 58° 22′. The mean temperature of the season differs only 2° 29′ from the annual mean of the station, and its mean diurnal range is 2° 38′, higher than that of the whole year. The difference of mean temperature between the coldest and hottest months of the season is 2° 64′. The average quantity of rain is 9. 05′ inches —about two-thirds of which fall in October. The average number of days on which rain falls in the season is thirteen.

It will be inferred, from the facts and observations which have now been stated, that the weather, throughout the five months of the cold season, preserves that degree of temperature which is most congenial to the feelings, and which invites to exercise in the open air at all hours ; and it is accordingly found, that, on a great proportion of days, persons are able to walk, and ride on horseback, during the greater part of the day, with great comfort, and perhaps without any immediate bad effect. But experience shews (and reasoning teaches us the same lesson) that this luxury, so rarely available in the Tropic Zone, must even here be indulged in by the invalid with exceeding great caution. The causes of this important restriction will be brought under review hereafter.

* The ingenious observations of Sir Humphrey Davy on this subject, refer exclusively to the foundation of mists over lakes and rivers. *Philosophical Transactions* for 1819.

March ushers in the hot season, the duration of which is extended through the two subsequent months. The atmosphere now assumes a dim and hazy appearance, so that the low-land hills of the Concan, appear distant and indistinct, and the sea is scarcely ever visible, except, perhaps, for an hour or two before sunset, when it may be occasionally seen on that part of the horizon immediately below the sun's disc.

There is a greater and more sudden transition of temperature in March, than occurs in any other month ; but the heat, which never attains a great elevation, is very materially tempered and moderated by the cool, soft, and refreshing sea breezes, which prevail with great, and almost unvarying regularity, during these months. They blow at first from N. N. W. but become more westerly, commence at an earlier hour, and increase in strength, as the season advances. They generally, however, set in about 10 o'clock, gradually freshen after noon, and subside in the evening, when, after a short calm, a north-easterly wind springs up and continues during the night, to be again succeeded by the sea breeze of the following day. Occasionally, at the commencement of the hot season, the north-easterly wind subsides early in the morning, and there is an interval of one or two hours' duration, during which the atmosphere is still and sultry until the approach of the sea breeze.

The heat is scarcely ever felt to be oppressive within doors; and is certainly much less so than what is experienced during the summer months at the Cape of Good Hope. Solar radiation, however, is very intense, especially during March and April ; and consequently exposure to the direct influence of the noon-day sun is

both unpleasant to the feelings, and prejudicial to the health. The nights are never close or hot, but are invariably cool and refreshing.

The air attains its greatest degree of heat in April, and of dryness in March. In April, an increase of humidity is perceptible, both by the sensations and by the indications of the moistened thermometer; and towards the end of the month, and in the early part of May, the sky is frequently chequered with clouds, and there are occasional short, but heavy, thunder showers, usually occurring at one of the principal lunations, which serve to reduce and equalize the temperature. During the latter half of May, the sky is generally clear or partially clouded during the day; but towards sun-set thin mists and fogs begin to rise from the westward horizon, and in a few minutes envelope the hills in their vapoury mantle; and are frequently observed to course rapidly over the mountain when a very light air prevails in the lower strata of the atmosphere. This is succeeded either by a clear, calm, serene night, with low patches of fog resting over some of the vallies, until dissipated by the morning sun; or, if the sea breeze keeps up, partial mists continue to flit over the hills at intervals through the night. This alternate succession of cloud and sunshine, of fogs and mists, along with the more uninterrupted westerly winds which now prevail, contributes very greatly to the coolness and equability of the climate, and renders it, next to October, the most agreeable part of the year.

The superiority of the climate over that of the low country during the hot months, is not more striking than is the contrast between the beauty and variety of fo-

liage, * and blossom which now decorate the mountain, and the arid and parched up surface of the plains below.

The mean temperature of the hot season is 72° 58′ and the mean daily range is 13° 19,′ the mean maximum of temperature being 79° 18,′ and its mean minimum 65° 99.′ The mean temperature of the season exceeds the annual mean by 6° 21,′ and the mean daily variation is 3° 35′ higher than that for the year. The difference between the mean temperature of the coldest and the hottest months of the season is only 2° 25.′ The mean amount of rain is 2. 84 inches of which the greatest portion falls towards the end of April and in May. The average number of days on which rain falls is 13.

Although frequent showers of rain usually fall from the beginning of June, the rainy season, strictly speaking, cannot be said to commence till from the 10th to the 15th of the month. Until that date, the weather resembles very much what has been described in characterizing the early part of October. There is the same pleasant variety of sunshine and cloud during the early part of the day, with a more settled westerly wind. Early in the afternoon, as the temperature of the atmosphere begins to decline, and its capacity of dissolving vapor, in consequence, diminishes, watery fogs begin to drift over the table-land, and are not dispersed until two or three hours after sun-rise on the following morning. These fogs gradually augment in density and humidity, and set in earlier, and disperse later, as the month advances.

* This is probably not altogether without effect in tempering the heat by the exhalation which takes place from the foliage, and by its effect in shading the soil from the solar rays.

The commencement of the monsoon is usually preceded by at least one thunder squall, which gives various warnings of its approach. In the early and middle part of the day, the air is found to be still and sultry. Dense, dark, lowering clouds gradually begin to gather in the South East ; the general stillness is now broken by the occasional muttering of distant thnder, and, by strong and sudden gusts of wind from the same quarter of the horizon, the masses of clouds rapidly thicken as they advance, and at length, let fall their surcharged moisture in a heavy torrent of rain amid the most beautiful and vivid lightning, and amid peals of thunder which reverberate from mountain to mountain, with a grand and terrific effect. This is followed, on the succeeding morning, by a clear and transparent sky, and by that delicious freshness of the atmosphere which so invariably follows a fall of rain on these hills.

The wind now fixes steadily in the S. W. or W. S. W., whence it blows with moderate strength ; the fogs and mists rapidly thicken, and close in the view on every side ; and at length (usually at some time between the 10th and the 15th) the monsoon sets in with a thick drizzling rain, which continues with few interruptions dur- the remainder of the month.

The hills, during July and August, are enveloped in almost perpetual clouds and fog. The visual horizon is thus limited within a very small circumference ; except when at intervals the fog partially opens so as to permit a hasty glimpse of some of the nearer objects, when it again closes in, and shrouds the surface with the same dense gloom as before. The atmosphere is supersaturated with moisture, which is precipitated with

very little interruption in the form of small, thick, drizzling rain, varying, at short and frequent intervals, with heavy drenching showers, which are often accompanied with a high boisterous wind. The sun's rays seldom for more than half an hour, or an hour at a time, penetrate the dense mass of cloud with which the sky is shrouded; but at the same time very little cooling takes place by terrestrial radiation, and consequently the climate is rendered not only very equable, but also very temperate. In September, the violence of the monsoon begins to subside. The wind abates in strength, the fogs are much less dense and frequent, and the rain-falls are reduced both in quantity and duration; and towards the latter part of the month there are frequent intervals of clear, fine weather.

The mean temperature of the rainy season is 64° 57′ which corresponds almost exactly with that of the cold season; but the mean daily variation of the former is only 3° 47′ the mean maximum temperature being 66° 31, and its mean minimum 62° 38′ The mean temperature for the season is 1° 80′ lower than the annual mean; and the mean daily variation is 5° 87′ less than that for the year. The difference between the mean temperature of the coldest and hottest month of the season, is 3° 53′ The average fall of rain is 227. 91 inches, of which nearly one third falls in August. The number of days on which rain falls is 108; there being 14 fair days, of which only two happen in the two months of July and August. The greatest quantity falls in August.

The continuousness of the rain, even more than its total amount, renders the station uninhabitable with

comfort during the monsoon, though this season of the year is remarkable for its healthiness. This is to be attributed to the uniformity and temperateness of the climate.

Such is a brief and condensed sketch of the usual progress of the seasons at this station. Their course has been remarkably uniform in the different successive years. The principal deviation, and the one which most affects both the actual temperature and the sensations, consists in the more or less clouded state of the sky in May, and the relative quantity of rain which falls in that month.

It will now be useful to present, in a tabular form, the mean and extreme results of the meteorological observations which have been recorded during the last eight years. The first table exhibits the meteorological characters of the successive months, and in the second will be found the distinctive features of the different seasons.

TABLE No. I.

Tabular View of the Meteorology of the Convalescent Station on the Mahableshwur Hills, for each month, from October 1st 1828, to September 30th 1836.

Months.	ATMOSPHERIC TEMPERATURE IN THE SHADE. MEANS. Mean temperature.	Mean Daily Variation.	Mean Maximum.	Mean Minimum.	Difference of mean Tempr. of each successive month.	EXTREMES. Extreme monthly variations.	Extreme Maximum.	Extreme Minimum.	ATMOSPHERIC HUMIDITY. Mean Depression of Moistened Thermometer.	RAIN. Quantity in Inches and Cents.	No. of Rainy days.	WIND. Direction. A. M.	Direction. P. M.	Force. A. M.	Force. P. M.	Appearance of the Sky, &c.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′					
October ..	65 68	8 22	69 79	61 57	1 34	19 00	73 00	54 00	4 00	5 57	10	Easterly	N. Ely.	Moderate	Light	Occasional drifting Fogs and Clouds during first three weeks; subsequently Clear.
November	64 00	11 57	69 79	58 22	1 68	21 00	72 50	51 50	8 93	2 91	1	do.	do.	do.	do.	Clear.
December	63 04	10 57	68 33	57 76	0 96	24 50	73 50	49 00	7 43	0 25	1	do.	do.	Light	do.	Do.
January ..	63 11	14 04	70 13	56 09	0 07	30 50	75 50	45 00	12 83	0 00	0	do.	N. E. Wly.	do.	do.	Do.
February .	64 59	14 22	71 72	57 47	1 48	32 00	78 00	46 00	13 13	0 32	1	E. N. E.	N. N. W.	do.	do.	Do.
March	71 82	13 99	78 82	64 83	7 23	30 00	87 00	57 00	16 78	0 07	2	N. E.	do.	do.	do.	Do.
April	74 14	13 41	80 85	67 44	2 32	34 50	90 50	56 00	12 60	1 32	4	do.	N. W.	do.	Fresh	Occasionally Clouds.
May	71 79	12 18	77 88	65 70	2 35	30 70	88 00	57 30	7 38	1 45	7	N. E. Wly.	Westerly	do.	do.	Frequent Fogs during latter half.
June	66 89	6 41	70 10	63 69	4 90	20 00	82 00	62 00		47 95	24	W. S. W.	W. S. W.	Moderate	Moderate	Passing Fogs first 10 days; subsequently continued fogs.
July	63 36	1 94	64 33	62 39	3 53	11 80	73 80	62 00		67 44	30	do.	do.	High	High	Continued dense Fog.
August ...	63 71	2 02	64 72	62 70	0 35	9 00	70 80	61 80		81 86	30	do.	do.	do.	do.	
September	64 34	3 54	66 11	62 57	0 63	16 50	73 50	56 00		30 66	24	do.	do.	Moderate	Moderate	Occasional light Fog.
Octennial means and extremes	66 37	9 34	71 04	61 70	2 23	34 50	90 50	45 00	10 38	239 80	134					

TABLE No. II.

Tabular View of the Meteorology of the Convalescent Station on the Mahableshwur Hills, for each season from October 1st 1828, to September 30th 1836.

Seasons.	Mean Temperature.	Mean daily variation of Temperature.	Mean Maximum Temperature.	Mean Minimum Temperature.	Difference of Mean Temperature of coldest and hottest months.	Difference of mean Temperature of each Season and the Annual Mean.	Difference of mean daily variation of each season and the Annual Mean.	Difference of Mean Temperature of each successive Season.
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
Cold Season 1st October to 28th February	64 08	11 72	69 95	58 22	2 64	2 29	2 38	0 49
Hot Season 1st March to 31st May	72 58	13 19	79 18	65 99	2 35	6 21	3 85	8 50
Rainy Season 1st June to 30th September	64 57	3 47	66 31	62 83	3 53	1 80	5 87	8 01

Mean and Extreme Octennial Results.

Mean Annual Temperature	66°	37′
Do. daily variation of do.	9	34
Do. Maximum do.	71	04
Do. Minimum do.	61	70
Extreme Diurnal variation do.	23	50
Do. Monthly do. do.	34	50
Do. Yearly do. do	42	50
Do. Maximuim Temp. in eight years	91	00
Do. Minimum do. do	45	00
Do. Range do. do.	46	00
Mean Temp. of Cold Season	64	08
Do. do. Hot do.	72	58
Do. do. Rainy do.	64	57
Difference of Mean Temp. of Cold and Hot Season	8	50
Do. do. do. of Coldest and Hottest months of the year	11	10
Mean Difference of Temperature of successive months	2	23
Etreme do. do. do. do.	7	23

Mean Annual Amount of Rain, inches.....	239	80
Do. No. of days on which Rain falls.....	134	
Extreme Annual fall of Rain; Inches.....	297	41
Do. Monthly do do. do.	118	54
Do. Daily do. do. do	11	32

It will be unnecessary to offer any lengthened observations upon the two preceding tables, which require little elucidation. As regards temperature—the most important element of climate—the results which have been deduced are highly satisfactory. The mean annual temperature is shewn to be 66° 37′ which is nearly identical with the estimated mean temperature of the Globe,* and is little more than a degree higher than the point marked "temperate" in Fahrenheit's thermometer—a climate at once congenial to the feelings and conducive to health. It corresponds very closely with the mean annual temperature of the Cape of Good Hope and New South Wales, in the southern system of climates; and with that of Madeira, and with the general temperature of the mediterranean, in the northern hemisphere.

It may happen, however, that places having the same mean annual temperature may yet differ most materially in their climates, according as the heat is more or less equally distributed throughout the day, and through the different months and seasons of the year. Taking this more extended view of the subject, we find that the equability of the climate is no less striking than its coolness, and that the different means and extremes of tem-

* The real mean temperature over the whole surface of the globe is computed by Sir John Leslie to 67° Fahr., which, he states, should occur on the parallel of 35° 51½. *Edinburgh Cabinet Library*, 2d ed. i. 25.

perature present a much more steady and limited range than is to be found in any of the countries that have been named. Thus, in regard to the variation of climate in the different seasons, the difference of mean temperature between the cold and the hot season (the winter and summer of our climate) is only 8° 50′, and that between the coldest and hottest month of the year amounts only to 11° 10′. It further appears (and this is a very remarkable and important result) that for nine successive months of the year, from June to February inclusive, the mean temperature of any month never differs more than 3° from the mean annual temperature; while the difference of temperature between each successive month of the year averages only 2° 23′. The equability of the daily temperature, which gives a mean result of 9° 34′ of variation, requires no comment.

The month of October, in its different particulars of temperature, approximates nearest to the mean annual temperature of the station.* The greatest degree of heat is experienced in April, and the greatest cold in December. The mean daily range is at its minimum in July, and at its maximum in February.

We frequently hear it remarked that one season, or one year, is much cooler than the preceding, or than some previous one. When we come to test the accuracy of such observations by a reference to the series of meteorological tables, we find that the difference between the mean annual temperature of each of the eight successive years, and the mean temperature for the

* We find, from the researches of Humboldt, that the temperature of October coincides very closely with the annual mean, as far as the isothermal line of 35° 6′.

whole period, averages only 0° 60′; and the greatest difference in any one year is only 1° 60′. The fact appears to be, that the differences alluded to depend principally upon the quantity of moisture in the atmosphere during the hot season, the relative proportion of which has a considerable influence upon the sensations, without materially altering the real temperature of the air.

The degree of humidity of the atmosphere during the cold and hot season, as indicated by the depression of a moistened thermometer, may be considered as tolerably moderate, though I do not possess any means of comparing it with other localities. The rapid cutaneous evaporation produced by the rarefied atmosphere conveys the impression of a drier state of the air than exists in reality; and, in consequence of this, an increase of the humidity in March, and (to a smaller extent) in January and February, would prove more congenial to the sensations.

The fall of rain is probably unexampled in amount. The mean annual quantity is 239. 80 inches, of which 227. 91 inches fall in the four monsoon months. The greatest annual fall (which occurred in 1834) amounted to 297. 41 inches—a result unprecedented, as far as I am aware, in the records of meteorology.* The extreme monthly fall (in July of the same year) was 118. 54 inches, which appears to have been exceeded at Cayenne, where 151 inches are stated to have fallen in the course

* The nearest approximation to this quantity that I have met with, is quoted by Humbolt from M. Pereira Lago, who *thinks* he found in the year 1821 only, at San Luis de Maranho, Brazil, 280 inches.

of one month. * It is the constancy of the rain, however, rather than its excessive heaviness, which principally contributes to swell out the total fall to so enormous an amount. Hence the greatest daily fall in eight years is only 11. 25 inches—a quantity which has frequently been exceeded on the western coast of India, and in other countries within the tropics, and more rarely at places situated in the temperate zone.†

On the subject of atmospheric pressure, I regret that my observations embrace only eight months, viz. from the 1st October 1831, to the 31st May 1832; and even these, I fear, are not entitled to much confidence. The mean height of the barometer during these eight months (as deduced from two daily observations of the maxima and minima) was 25. 437 inches ; and the mean daily range 0. 042 inches.

One most important point connected with temperature remains to be investigated ; I allude to solar radiation, without a due knowledge of which we shall be apt to form a very erroneous estimate of a tropical mountain climate. I have kept this branch of the subject distinct from the preceding summary of the climate, because my observations have, as yet, extended only to the cold and hot seasons of 1836-37.

The daily means and extremes for the months of October, November, December, January, March, April, and May, are contained in the subjoined table. The results are obtained from a mercurial thermometer, (with

* Humboldt, on the authority of Captain Roussin.

† No less than 30 inches of rain fell at Geneva, on the 25th October 1822. Pouillet, Elemens de Physique et Meteorologie. ii. 758.

a metallic scale attached,) having its bulb covered with coarse black wool, and exposed horizontally on an open level spot of ground, with two folds of coarse brown paper interposed between the soil and the instrument. It is to be kept in mind that the temperatures are not taken from a self-registering thermometer, and embrace, therefore, only the limits of observation.

TABLE No. III.

Table shewing the Means and Extremes of Solar Radiation during the Cold and Hot Season of 1836-37.

Months.	Means.				Extremes.			
	Mean Maximum height of Thermometer in Sun.		Mean Maximum amount of Solar Radiation.		Greatest Maximum height of Thermometer in Sun.		Greatest amount of Solar Radiation.	
	°	′	°	′	°	′	°	′
October	127	9	54	8	151	5	75	0
November	109	6	41	4	134	0	66	0
December	118	2	51	3	132	5	62	3
January	120	5	51	0	138	0	66	7
February	130	6	57	1	143	0	68	2
Means and Extremes of Cold Season.	121	36	51	12	151	50	75	00
March	130	7	53	7	143	0	69	0
April	134	2	53	2	144	5	59	9
May	135	7	58	1	144	5	64	5
Means and Extremes of Hot Season.	133	53	55	10	144	00	69	00

I regret that I have no data whereby to institute a comparison between the results indicated in the foregoing table, and the effects of solar radiation on the adjacent plains, or in countries possessing a corresponding climate in higher geographical parallels. I am conse-

quently unable to state how far they are corroborative, or otherwise, of the principle long ago announced by Saussure and other observers—that the calorific effects of the direct rays of the sun increase with the elevation above the levels of the sea; but I think I have generally remarked that the interception of the sun beams by a cloud, or their diffusions by a breeze, is attended by a greater proportionate reduction of temperature than is experienced below, under similar circumstances. I hope, on a future occasion, to submit to the Society some more extended observations on this interesting subject.

It has been remarked by Sir John Herschell, that most eminent of modern philosophers, that "the true indication of the force of the solar rays is not the statical effect upon the thermometer, but their momentary intensity measured by the velocity with which they communicate heat to an absorbent body.* The preceding opinion throws considerable doubt upon the accuracy of our present modes of observation. Indeed, it will be found that no two thermometers, however accurate, will precisely agree in their indications, if registered every hour throughout the day; and some recent experiments have convinced me, that after the solar heat rises above 113° or 115,° the indications of a thermometer with a metallic scale will generally be higher by several degrees than one with a wooden scale attached. From this cause, the results shewn in the

* 1st and 2d Reports of British Association for the advancement of Science.

foregoing table are higher than they would otherwise have been.*

The daily progression of temperature is found to vary somewhat at different seasons of the year. The period of greatest cold occurs almost invariably at day-light; the time of greatest heat is not so regular. In the early part of the hot season, the thermometer does not attain its greatest elevation till near 3. P. M., while, on the other hand, in the latter half of May, and in the early part of the months of June and October, owing to the frequent interception of the solar rays soon after mid-day, it reaches its maximum point as early as 1 P. M. The average period, however, of greatest daily heat throughout the year, may be stated as occurring at 2 P. M. The sun's direct rays again attain their maximum force at varying intervals between 12 and 1 o'clock, and indeed do not increase much after 11; so that in the hot season, when the temperature in the shade is at its maximum, the thermometer in the sun has fallen 15° or 20.° This important result ought to be taken advantage of by those who are obliged to expose themselves to the sun during the day.

The means of temperature observed each day at 9 o'clock A. M. for three years, exceeded by only half a degree the mean annual temperature deduced from the

* By a reference to the researches of Mr. Daniell, it will be found, that, though the mean maximum force of solar radiation in London, during the three hottest months, is only 34° 5,′ or nearly two-fifths less than it is here during the hot season, yet the extreme temperature of the sun rays is 154,° which is 2½° higher than I have ever observed at this station. Daniell's Met. Essays, 2d edit 210, 267.

daily maxima and minima for the same period; this small excess occurring principally in the hot season. Hence it follows, that one observation made daily at that hour, or a few minutes before it, will represent very nearly the mean temperature of the day.

It will form an appropriate conclusion to this brief summary of the physical qualities of the climate, and enable us more correctly to estimate its precise value, if we compare its principal features with those of the Cape of Good Hope, and of the adjoining countries of the Concan and Deccan. I select the two latter climates, because they are those to which the greater proportion of visitors have been exposed previous to their arrival here; and I select the Cape of Good Hope, because it possesses a climate in many respects analogous to this, and because it forms the principal resort for invalids from India. I shall take the Island of Bombay as a standard of comparison for the general climate of the Concan, and the station of Poona for that of the Deccan.*

* The Bombay temperatures are these of 1827, and are deduced from two daily observations made at sun-rise and at 4. P. M. The mean maximum however, of May, June, July and August, are those of 1 P. M., which were found somewhat higher than those of 4. P. M. during these months. *Edinburgh Journal of Science.* The Poona observations extend from the 1st November 1828 to the 31st October 1829, and are taken from Major Syke's MSS. Reports.

TABLE No. IV.

Table shewing the Comparative Means and Extremes of Temperature, at the Mahableshwur Hills, Bombay, Poona, and the Cape of Good Hope.

Months.	MEAN TEMPERATURE.								MEAN DAILY VARIATION OF TEMPERATURE.								EXTREME MONTHLY VARIATIONS OF TEMPERATURE.							
	Mahabuleshwur.		Bombay.		Poona.		Cape of Good Hope.		Mahabuleshwur.		Bombay.		Poona.		Cape of Good Hope.		Mahabuleshwur.		Bombay.		Poona.		Cape of Good Hope.	
	°	′	°	′	°	′	°	′	°	′	°	′	°	′	°	′	°	′	°	′			°	′
January	63	11	73	81	71	02	76	00	14	04	9	48	15	09	14	50	30	50	18	00				
February	64	59	77	48	73	06	79	00	14	22	9	14	17	01	13	75	32	00	16	50				
March	71	82	78	87	76	04	75	00	13	99	6	86	21	04	10	37	30	00	15	25			28	50
April	74	14	81	80	80	08	67	00	13	41	9	05	16	05	13	08	34	50	14	50			35	30
May	71	79	85	54	84	00	62	00	12	18	5	19	14	07	12	92	30	70	11	00			37	50
June	66	89	83	00	86	02	57	67	6	41	2	81	10	03	12	23	20	00	12	50			34	50
July	63	36	84	11	81	03	57	33	1	94	7	06	3	04	13	16	11	80	5	50			35	20
August	63	71	80	14	81	04	60	00	2	02	2	16	6	01	10	34	9	00	5	75			28	20
September	64	34	80	50	79	09	63	00	3	54	3	11	5	04	12	97	16	50	6	50			33	50
October	65	68	82	64	81	05	63	00	8	22	7	00	8	03	12	08	19	00	11	75				
November	64	00	80	42	77	09	73	50	11	57	7	86	6	07	13	50	21	00	20	00				
December	63	04	74	25	66	07	75	00	19	57	11	10	26	06	14	00	24	50	25	00				
Annual Means and Extremes	66	37	80	21	78	41	67	38	9	34	6	73	12	74	12	74	34	50	25	00			37	50

On examining the foregoing table, it will be observed that the mean annual temperature of this station is 13° 84′ cooler than that of Bombay, and 12° 04′ lower than that of Poona. Again, with regard to the mean daily range throughout the year, it appears to be 3° 42′ less here than at Poona, and 2° 61′ greater than at Bombay. If we analyze this extreme equability of the Bombay climate, we shall find that it arises principally from the excessive heat of the nights, which especially characterizes six months of the year, from May to October inclusive. Thus the mean minima temperatures at Bombay throughout the year are 5° higher than the mean maximum heat at this station; in other words, the *nights* at Bombay are 5° hotter than the *days* are here. It is to this unvarying continuance of a high temperature from day to day, without the intervention of cool nights, that we are to attribute the wearing, wasting effects on the system which a long continued residence at Bombay, and on the Coast generally, is apt to produce; while the injurous effects of the Deccan climate again, which are of a more acute and dangerous nature, result from an opposite cause—the sudden and extensive vicissitudes of its climate—and are principally developed in the cold season. From both these extremes of uninterrupted heat, and of extensive transitions of temperature, the climate of these Hills is happily exempted.

The climate of the Cape of Good Hope presents some interesting points of comparison, which will more conveniently come under review hereafter.

Such are some of the principal features of the climate of this station, as deduced from the meteorolgical observa-

tions of eight years. The causes upon which its physical qualities depend, may be thus briefly stated.

1st. The first and most influential of these causes, is the local elevation of the station. The atmosphere, having escaped from about one-sixth of the incumbent pressure, thus becomes rarefied to a considerable extent; its capacity for heat is increased in a corresponding ratio, and its local temperature proportionately reduced. By this altitude of 4500 feet above the level of the sea, it acquires a reduction of climate amounting nearly to 14° below the adjacent plain, which is equivalent to a change of latitude of about 18.° * The same cause, there is reason to believe, produces another effect of a less favorable nature—an increased intensity of solar radiation.

2d. The proximity of the station to the Indian ocean forms an important modifying agent in the constitution of the climate, and gives it, in some degree, an insular character. To this cause we are indebted for the regularity and strength of the sea breezes, which so materially moderate the temperature of the hot season, and impart an agreeable softness and humidity to the atmosphere, which would otherwise be very unpleasantly dry during these months. The remarkable equability of the climate is also to be traced principally to the same source. The vicinity of the sea must obviously give this climate

* The computed mean temperature for a place situated in latitude 36 (according to Meyer's formula) is 66° 2,′ which is within a decimal part of the mean annual temperature of this station. This corresponds with what we have stated regarding the climate of the Cape of Good Hope.

a superiority over that of more inland mountains of equal elevation.

To a combination of the two causes which have now been named—proximity to the sea, and that particular altitude at which the air, from its rarefaction, and reduction of temperature, has its capacity for dissolving vapour, so much reduced as to precipitate part of its aqueous vapour—is to be ascribed the redundant humidity which prevails in the rainy season.

3d. The small lateral extent of the table land, by insulating it from the surrounding country, lessens the amount of radiant heat which would be emitted from a more extended plain; while the diversified nature of the surface gives a certain degree of obliquity to the sun's rays, and thus, in conjunction with the former cause, diminishes somewhat their calorific influence.

4th. Another point to be mentioned, which is connected with the preceding one, is the position of the station on the westerly, or sea-ward brow of a steep and precipitous mountain, the base of which is very little higher than the level of the sea. By this topographical disposition the sea breezes are wafted to it, without being heated by travelling over any intermediate space of equal elevation with the hill itself; and a certain degree of protection is also afforded against the East winds. This position of the station on the verge of the mountain might be open to objection, were the country at its base the seat of endemic fever. This, however, is not the case.

5th. The last cause to be noticed, is the absence of higher ranges in the immediate vicinity, which might

have the effect of rendering it liable to sudden and extensive vicissitudes of temperature.

We now proceed to investigate the medical qualities of the climate, or its practical application to the preservation and restoration of health. Its influence upon the human constitution in a healthy condition, or what may be termed its physiological effects, come first to be considered.

The primary influence of the climate will be modified, to a considerable extent, by the particular temperament of the individual, and by the average temperature and humidity of the climate to which he has been previously exposed. Its immediate and more obvious operation, in the generality of cases, will be to increase the force of the circulation, to improve the appetite, and promote the digestive and assimilative functions, and to impart an augmented degree of muscular vigor, and mental energy, to the system. These effects are of a tonic nature, and are to be ascribed, in a great degree, to the relative diminution of temperature. They bear considerable analogy to the effects produced by the internal use of what are usually termed tonic medicines. The most important difference is, that the application of climate is general; whereas the primary operation of tonic remedies is local, and at first directed to the stomach; and while the continued administration of the latter for any length of time is apt to prove injurious, the system harmonizes with the climate more and more by continued exposure to it, and continues to derive increasing benefit from its agency. A person of spare habit and of a phlegmatic temperament, will, in general, benefit more than the sanguine and plethoric; and the indi-

vidual who has previously been exposed to a warm and dry climate, will find the change more congenial at first, than the one who has come from a warm and *moist* one.

The effects which have now been described are the usual and obvious accompaniments of a change from a warm to a cooler climate. There are other phenomena of a highly interesting kind, arising from the increased rarefaction of the atmosphere, and its diminished pressure upon the body, which it will be necessary to consider separately, and more in detail. These consist in changes affecting the general circulation, cutaneous secretion, and the respiratory function of the lungs.

The first peculiarity to be noticed is its stimulant operation upon the vascular system. In addition to the tonic effects which have already been referred to, there is a peculiar feeling of excitement produced by the climate of this station, (and, I presume, of all elevated countries,) which is not experienced in climates of corresponding temperature at the level of the sea. This is sometimes accompanied by tightness across the forehead, and occasionally by head-aches; in a few by a peculiar ticking sensation in the head, and occasionally by a drumming, or rushing noise in the ear. These symptoms cannot be ascribed to the suddenness of the change from a hot to a cold climate ; for in a voyage to Europe, at certain seasons of the year, equally sudden and extensive transitions of temperature are undergone, and no such sensations are experienced. That they are not to be attributed to any increase in the absolute or relative amount of Oxygen in the atmosphere, is proved by the ascertained law of the equal expansibility, at different temperatures, of all gases and vapors, whether separate or combined ; as al-

so by the established fact, that the two principal, constituent gases of the atmosphere maintain the same relative proportion in all countries, and at all elevations. Hence the absolute and relative amount of Oxygen being the same, it will (from the greater dilatation of the atmosphere) be applied in a less concentrated state than at the level of the sea. The experiments of Sausure, indeed, led him to conclude that a greater proportionate quantity of carbonic acid gas exists in the higher than in the lower strata of the atmosphere ; but, allowing these experiments to have been accurate, an additional quantity of this gas would have a directly contrary tendency, and act as a sedative rather than a stimulant. Sir Humphry Davy, it would appear, ascribed the excitement to the increased intensity of light in the higher regions of the atmosphere. *

Without having recourse to any of these theories, the sudden change in the relative amount of atmospheric pressure seems to afford a satisfactory explanation of the phenomena. If the pressure of the air be partially removed from any part of the body, by the application of a cupping glass, an increased quantity of blood immediately flows to the surface thus exposed. On the same principle, we are naturally led to infer, that, if the whole surface of the body suddenly escape from about one-sixth of the atmospheric pressure to which it was subjected at the level of the sea (as happens at this station,) there will be an accelerated action of the heart and arterial system, and the blood will be propelled with increased momentum to the different

* Dr. Home's MSS. Lectures on Materia Medica.

parts of the system. Analogous plenomena are occasionally experienced during immersion in a tepid water bath (especially if perspiration be not induced,) and arise from the same cause—the partial subtraction of atmospheric pressure from the surface. Thus have we a ready solution of the stimulant qualities of the climate and of the phenomena to which they give rise. They are, to a certain extent, experienced by almost every one for a few days after his arrival; though more inconvenience is generally felt by the visitor from Bombay, the Concan, and the Coast stations of Guzerat, especially, if he be of a phethoric habit, than by the resident of the Deccan. *

It is a common opinion that the usual effect of a hill climate is to repel the blood from the surface, and produce vascular congestion in one or more of the internal organs, and thereby to produce a change of distribution in the circulating mass. This opinion, it appears to me, has been taken up on insufficient grounds, and is amply refuted by the strong pulse, the glow of skin, the muscular vigor, and other symptoms which indicate an augmented action of the superficial vessels, and which are directly opposed to the small, weak pulse, the cold, pale

* It would appear that a certain degree of atmospheric pressure is necessary to keep up the equilibrium between the living solids and the fluids contained in them; that inconvenience is experienced either by considerable increase or diminution of pressure; and that the phenomena produced in both cases (as in the diving bell or on very high mountains) are very much alike. There must consequently be a certain limit of elevation beyond which the constitution suffers from the diminished pressure; and this limit will probably vary in different latitudes.

skin, and the languor and lassitude which characterize a recession of blood from the surface, and a corresponding accumulation in the internal vessels.

The tendency of this state of general excitement, and of the augmented vigor of the digestive and assimilative functions, is to produce more or less repletion of the sanguiferous vessels. In the healthy constitution, a due relation will be preserved between the arterial and venous systems; the blood will circulate equably through the different organs ; no derangement of function will take place ; and there will be a general and progressive improvement in health and strength. Should there be predisposition to disease, on the other hand, in any of the principal viscera, then considerable precaution will be required, (by strict dietetic regimen, and the avoidance of exposure to the meridian sun, and other causes of stimulation,) in order to avoid the injurious effect which might result to the affected organ, from this state of general phethora.

The next distinctive operation of the climate to be noticed, is its modifying effect upon the cuticular secretion, regarding which very vague and discordant opinions have been entertained. In our enquiries into this subject, it is necessary that we should bear in mind that there are two kinds of cutaneous discharge, viz. insensible perspiration, or which has been termed perspiration by evaporation, which is, in a great measure, a physical action—and sensible perspiration, or perspiration by transudation, which may be considered as more strictly a vital function. These two modes of cutaneous exhalation cannot altogether be separated from each other, because part of the sensible perspiration may pass off

in the form of vapor, or a portion of the insensible perspiration may be condensed on the surface, and assume the form of sweat; but still they differ so much in their nature as to be very differently affected by the same agents, and therefore require separate consideration.

Reasoning on this subject, we should *a priori* infer, that the perspiration by evaporation, in as far as it is a physical action, would be increased by a diminution of atmospheric pressure, in the same way, though not perhaps to the same extent, that evaporation from the surface of water is augmented under similar circumstances.

Again, as regards sensible perspiration, considered as more purely a secretory process, we are led to expect that it will be increased also, though not in the same degree. We have already seen that, by removing part of the usual atmospheric weight, there is an increased determination of blood to the capillary vessels of the skin, and there is a presumption that there will be a corresponding increase of cutaneous transudation, unless counteracted by some opposing cause.

The recent experiments of Dr. Edwards have thrown considerable light upon this heretofore obscure, but highly interesting, branch of physiology.* That talented Physiologist has shewn, by a series of ingenious experiments upon both cold and warm blooded animals, that the loss by perspiration from animals placed within the receiver of an air pump containing rarefied air, is greater than that of individuals of the same species exposed, at the same time, to the open air. He has also demonstrated that the insensible perspiration is very considerably increased by the dryness of the air.

* Influence of Physical Agents on Life, p. 170.

There remains another important element to be taken into account before we can attain to a complete solution of the questions under consideration ; I allude to the influence which cold exerts upon perspiration. There is here a two-fold reduction of temperature : the one the result of climate, the other produced by the rapid evaporation from the surface. The effect of both is to diminish perspiration, though not to any considerable extent at the usual temperature of this station.*

From what has been stated, it results that an increase of perspiration is produced at all times by the rarefaction, and, during the greater part of the year, by the dryness, of the atmosphere, which characterizes this climate ; while, on the other hand, a diminution of this process arises from its reduced temperature. The excess in the former principally affects the perspiration by evaporation, while the deficiency in the latter operates on that by transudation. The excess in the one, in all probability, very nearly compensates in quantity the loss in the other ; but as the amount of evaporation in the healthy state of the system is to that of transudation as 7 to 1, and as the former contains a smaller impregnation of saline and animal matter than the latter, a change in their relative proportions must produce very different effects on the system, according as the one or the other predominates. An increase of transudation will be more debilitating than a corresponding augmentation of insensible perspiration.

It is the aridity produced by the rapid evaporation which takes place from the surface which has led to the

* Edwards, Loc. Cit.

prevalent, and, as I think, erroneous, belief that a considerable check is given to perspiration at this station. That the feeling of dryness and constriction of skin, which is frequently complained of for some days by persons coming from the moist climate of the Coast, is to be attributed to the augmentation of cutaneous evaporation, and not to the diminution of cutaneous exhalation, is proved by the fact, that the disagreeable feeling is at once removed by any accidental increase of humidity in the atmosphere, (such as the appearance of a fog, or a fall of rain,) which moderates the evaporation : and this result, be it observed, is produced, notwithstanding the reduction of temperature with which such a change of weather is usually accompanied, and which, from its well known effect of diminishing the cuticular discharge, would tend to aggravate, rather than to relieve, the unpleasant sensation, did it in reality arise from checked perspiration.*

Nothing, in my opinion, would tend more to improve the agreeable qualities of this climate, and, at the same time, prove more conducive to its healthiness, than the diffusion of an additional quantity of aqueous vapor in the atmosphere during the latter months of the cold, and early part of the hot, season. Should the contemplated plan be carried into effect, of forming a lake in the valley of the Yenna, (which appears as if scooped out by the hand of nature for the purpose,) by throwing a dam cross its narrow outlet, it will not only prove a great ornament to the station, but go a considerable way to-

* It is probable that the rarefied state of the atmosphere tends also to produce an increase of pulmonary transpiration ; but facts are still wanting on this subject.

wards remedying the inconvenience now complained of. To this plan there may be brought forward, as an objection, the danger of malaria, and its attendant diseases. There is not, however, much ground for such an apprehension. We have already seen that, even during the south-west monsoon, when 227 inches of rain fall in little more than three months, the ground never assumes a muddy or swampy appearance ; and diseases of malarious origin at this station have never come under my observation.

We now proceed to examine the influence of the climate upon the respiratory function of the lungs. We have seen that the atmosphere of this station is rarefied to the extent of diminishing its pressure upon the system to about one-sixth of its total amount. It is evident, that at each ordinary inspiration a person takes in one-sixth less air than he would do at the level of the sea. Hence a necessity arises either for a greater dilatation of the air-cells of the lungs, or for an increase in the number of respirations. To this is to be added the increased impetus given to the pulmonary circulation by the diminished barometrical pressure, and a consequent augmentation of the quantity of blood to be aerated. No inconvenience, however, is ever experienced here, even on first arrival, in a healthy condition of the respiratory organs ; the lungs being enabled, by an increase of action, to meet this additional demand made upon them. Running, or rapid walking, up an acclivity, may perhaps produce breathlessness sooner, or to a greater degree, than similar exercise would on the plains ; but the " tightness in the chest and oppression of breathing," complained of on first ascending the Neilgherries, is

never felt here, so far as I am aware of. But it follows, from what has been stated, that the climate will be injurious in cases of disease, where the respiration isalready limited either by obstruction of any of the bronchial tubes or air-cells, or by other pulmonary lesion. It is important, however, to remark, in connection with this subject, that inflammatory affections of the lungs, or Pleura, are of extremely rare occurrence, either among Europeans or Natives, at this station.

The last subject of enquiry, and the one to which the preceding observations are subservient, is the investigation of the sanative influence of the climate ; or, in other words, of the uses to which it may be applied as an auxiliary remedy in the treatment of disease. If the view which has been given of its physiological effects be founded upon correct observation—if its mode of operation be essentially tonic and stimulant, and its action be exerted upon the general system, it will follow that the same principles which guide us in the administration of tonic medicines will direct us (with the exceptions already noticed) in the application of this climate to particular diseases.

The efficacy of change of climate in the treatment of disease has been recognized in all countries and in all ages. Without being able to explain the rationale of its agency, it is nevertheless a fact familiar to every medical man, and particularly so to every practitioner in India, that many diseases, which resist every other remedy, are frequently alleviated or removed by change of climate, or sometimes even by change of air. It is not to be expected, however, that climate alone will cure the disease. It ought only to be considered as an auxiliary remedy,

placing the patient on a position where the system is more tolerant of other necessary remedies, and where the disease is more amenable to the action of medicine. Hence medical treatment and dietetic regimen, with certain modifications, are equally necessary, (and are sometimes even more imperatively required,) in the one locality as in the other.

It may be useful briefly to advert to certain precautions necessary to be observed by the invalid on his arrival at this station. We have seen that there will be at first a tendency to repletion from the increased action of the sanguiferous vessels, acting on a system already excited by travelling, and from the increased activity of the digestive functions. To counteract any bad effects which might result from these causes, it will be necessary to avoid all extraneous sources of stimulation ; to abstain for a short time from too much muscular exertion ; to avoid exposure to the noon-day sun ; to pay due attention to the state of the bowels ; and to keep a curb upon the appetite (if inordinately increased) by a sparing use of stimulant articles of diet, and by lessening for a short time the customary allowance of wine, or other fermented liquors. It will require very little argument to demonstrate the utility of restriction in regard to diet. The invalid will soon learn, from personal experience, that the appetite outstrips the digestion, and that over-indulgence in the pleasures of the table will be followed by its usual dyspeptic accompaniments. This, however, is the least of the injurious consequences to be apprehended : an evil of greater magnitude is, that, by supplying a greater quantity of nutriment than the system has previously been accustomed to, another cause

of stimulation is added to the excitement already produced by the diminished atmospheric pressure. This caution it behoves every invalid carefully to bear in mind ; and where there is any tendency to visceral plethora, whether inflammatory or congestive, it becomes of paramount importance.*

After the system has recovered from the excitement of travelling, and from the first re-action of the climate, the valetudinarian ought to be, as much as possible, in the open air during the mornings and afternoons, keeping within doors during the heat of the day. He ought also to avoid exposing himself at an early hour in the morning to the high easterly winds which occasionally blow during the cold weather, and prove injurious to the delicate invalid, especially if suffering from recurrences of fever. It is much better that such patients should be deprived of exercise for a few mornings than that they should run the risk of suffering a relapse of fever, to which these high east winds powerfully contribute. The kind and degree of exercise must be adapted to the strength of the patient, and to the nature of his disease. Speaking generally, exercise on horseback will at first be more beneficial than walking. It is less fatiguing and it has a less accelerating effect upon the pulse and respiration ; while, at the same time, it promotes in a greater degree the abdominal circulation. The more healthy and robust may profitably combine both. But whatever kind of exercise may be had recourse to, it ought never to be carried to the extent of producing fatigue. If the invalid experience much lassitude, or if,

* The invalid will do well to take a light cold tiffin, without wine ; and to defer dinner until the evening.

on the contrary, he feel heated and excited in the evening, the inference may be drawn in both cases that the exercise has been carried beyond the capabilities of the system.

Warm clothing is so obviously indicated, that it may be considered superfluous to adduce any arguments in its support. It is important, however, to enjoin strict attention to this point in the case of children, who, from their generating less heat than adults, have their temperature more easily lowered.

I now proceed to notice the different diseases for the removal of which a visit to this station may be recommended with prospect of advantage. As these consist almost entirely of functional disorders, (and derangement of functions, it may be remarked, constitutes the largest portion of medical practice,) it is difficult to convey any thing like a definite idea of their nature, except by a detailed delineation of their external characters. This will be my apology for entering more fully upon this branch of the subject than I could have wished, or than would otherwise have been necessary. It may be premised, that it is contraindicated in all affections of the thoracic viscera—in all acute inflammatory diseases—in well-marked cases of organic visceral disease—and generally in all affections attended with increased arterial action.

I. *Fevers.* There is no order of diseases in which the medical virtues of this climate have been more successfully exerted than in fevers. The most important form of fever under this Presidency, both as regards the frequency of its occurrence and the tediousness

and obstinacy of its character, is the endemic fever of Guzerat, and this is the one which is most frequently submitted for treatment at this station. The type is found to vary according to the constitution and habits of the individual, the nature of the locality, and the characters of the season. The cases which have come before me have generally commenced as remittents. A few of them have been ushered in with dangerous severity; but the greater number (even when they proved very intractable in their subsequent progress) were unaccompanied from their commencement with any very urgent symptoms, and were attended with very distinct remissions. So little pyrexia is present, in some instances, during the period of remission, that the patient, when asked whether the fever was intermitting from its commencement, is occasionally unable to give an immediate reply, until he recollects that the exacerbations were not accompanied by rigors. The disease usually subsides within a week or ten days, and is followed by fever of the intermittent type; and at this stage the patient is usually sent for change of climate to Bombay, where he, in most cases, derives considerable benefit for the first few weeks. As the hot season advances, he is finally recommended to proceed to this station, with the view of accelerating the cure under the influence of a cooler and more invigorating atmosphere.

On his arrival here, the case usually presents one of the two following forms, which occur in tolerably equal proportions. In both instances the strength is usually much impaired, and there is a considerable reduction of flesh.

In the first case, the patient has return of fever at each

of the two principal lunations, more rarely at only one of them ; each relapse consisting of one, two, or three paroxysms, which are occasionally quotidian, but more frequently tertian. These paroxysms are unaccompanied by any marked symptoms of local excitement or congestion ; and in the intervals the patient is free, or nearly so, from complaint. In examples such as that now described, the effects of the climate, aided by the usual medical regimen, are strikingly beneficial. The digestive functions recover their healthy vigor, there is a progressive improvement of flesh and strength, there is either no return of fever, or the paroxysms become gradually less frequent and severe, until they altogether disappear ; and the patient finally leaves the Hills in robust health.

In the second modification of the fever, each paroxysm is accompanied by indications of a local complication of one of the principal internal organs. This local affection may have been present from the commencement of the fever, or it may have supervened at the period of the disease assuming the intermittent type. It is usually little, if at all, complained of during the intermission. The viscera most generally affected are the liver and spleen ; and the organ, which is the seat of disorder at the outset, usually continues so during the subsequent progress. To this, however, there are exceptions.

It is difficult to say what the precise nature of this local affection usually is. There is reason to think that it is not inflammation, because all local uneasiness may subside after the paroxysm, and no functional derangement may follow ; and also because I have seen two or three organs successively and repeatedly affected in the course of the same case, without the affection of more

than one organ during any paroxyms. It probably consists, in many instances, of a state either of local arterial excitement, or local venous congestion. In the one case, according to my acceptation of these terms, there will be an augmented activity of circulation (with consequently an augmented afflux of blood) in the arteries of the affected organ, constituting a state short of inflammation, and not giving rise to any of its products or terminations. In the other, there will be a languid and retarded circulation (and consequently an accumulation of blood) in the venous system, and particularly in the large vessels. Whatever may be the anatomical pathology of these local determinations, their presence indicates a description of fever much less amenable to treatment than the other ; and there is the danger of their eventually passing into organic lesion.

The result of our experience of these more aggravated forms of fever at this station has been favorable, though, of course, less satisfactory than in the preceding class of cases. By avoiding exposure to the sun and to the high east winds, by attention to the state of the bowels, by occasional local depletion, by anticipating the paroxysm by large doses of quinine, and by confinement to bed on the days of the expected paroxysm, the great proportion of them have been removed. In some cases, however, it has been found that the cure has not been permanent, from the residence of the patient not having been sufficiently prolonged. Officers frequently return to their stations towards the end of May, after having been free from fever only for one or two months, and are then at once exposed during the ensuing monsoon to the original exciting causes of the disease. The consequence

is that they frequently have a relapse, which proves more obstinate than the original attack. Hence we have hitherto failed, in such cases, in reaping from this climate the full benefit which it is calculated to yield. A plan for remedying this evil has recently been adopted, by which officers who do not appear to have permanently recovered spend the monsoon at Sattara, which is only thirty miles distant from this station, and possesses a very temperate and equable climate during these months. They return to the Hills during October and November, and proceed to their respective stations about the 1st of December. By this arrangement they are absent from the locality of their fever during one whole season, and they have the additional advantage of rejoining their station at the coolest and healthiest period of the year.

Fevers, either of an intermittent or a remittent type, are of comparatively rare occurrence at Bombay, and other places on the Concan Coast. Uncomplicated, as they usually are, with visceral disease, they derive great, and almost immediate, benefit from this climate.

There is, perhaps, no description of fever to which a hill climate is less adapted than to the remittent fevers of the Deccan, which are, in general, most benefited by the air of the sea coast. In cases of tardy and imperfect convalescence from the disease and in intermittent fevers, whether primary or supervening to the remittent form, the climate of this station has a very beneficial effect.

II. *Functional Disorder of the Digestive and Biliary Organs.*—The co-existence of dyspepsia with functional disorder of the liver, and with impaired or

irregular action of the bowels, is of very frequent occurrence in this country. However practically important it may be to ascertain with accuracy the precise etiological relation subsisting between the disordered functions of the stomach, liver, and bowels, in such cases, it is often a matter of considerable difficulty to make the diagnosis: for we find, in point of fact, that sometimes one organ, sometimes another, appears to be the seat of the primary disease; nor have I observed that this diversity in their apparent order of sequence is uniformly connected with any marked modification of their symptoms. The diseases referred to have, in general, presented themselves to me at this station under the following modifications. (1.) One is characterized by slow, uneasy, and imperfect digestion, (with its attendant symptoms,) and a habitually torpid state of the bowels, with scanty, pale coloured and clayey, or dark and pitchy, evacuations; and appears to depend primarily upon atony of the liver. It is of frequent occurrence in the Deccan. (2.) In another there is less disturbance of the digestive of the stomach; the bowels are alternately constipated and relaxed, with muddy evacuations; and there is generally a greater impairment of muscular and nervous energy, and a greater loss of flesh. This appears to be connected with a low inflammatory action of the mucous membrane of the upper part of the colon, and seems to be most prevalent at Bombay, and other places on the coast. (3.) In a third form of the disease, the affections seems to depend more immediately upon atony of the muscular tunic of the bowels. There is habitual constipation, with scanty, costive, but otherwise natural, evacuations; and there is a necessity for the almost

daily use of aperient medicine. The appetite is here better than the digestion: there is a frequent complaining of uneasiness in some part of the bowels, and a tendency to tympanitic distension of the abdomen. In some of the cases belonging to the last head, there appears to be irregular muscular action of the bowels. The motions are scantier, and of a softer consistence than usual, and have a flattened appearance. There is a feeling of obstruction in some part of the canal, and of inefficiency to evacuate its contents. This third form of the disease is aggravated by mercurials, and appears to be most successfully combated by a combination of tonics and gentle aperients. In all these modifications of functional derangement of the digestive organs, differing, as they do, from each other in some points of their pathology, and requiring corresponding differences of treatment, the climate of these Hills has been obviously and decidedly beneficial.

III. *General Debility, Cachexia, and disordered state of the General Health.*—The various diseased states classified under this head, differing, as they do, from each other in many particulars, bear at the same time a certain degree of mutual relation. They embrace all those cases which come under the denomination of disorders affecting the general system, and all the train of symptoms which arise from general debility, or of which debility constitutes the most prominent feature, and which are popularly considered to indicate a break up of the constitution. They are characterized, in general, by more or less derangement of the chylopoietic and assistant chylopoietic viscera, great prostration

of muscular strength, and incapacity for mental application, loss of flesh, varying combinations of hypochondriacal and nervous symptoms, and other less obvious indications of impaired general health. In many of these cases there has been a gradual, and almost imperceptible, transition from health to disease; and they are generally the result of long continued exposure to a tropical climate, and more particularly to the relaxing influence of a hot and humid atmosphere—or of intenseap-plication to official duty, and the sedentary life which usually accompanies it—or of tedious convalescence from acute disease—or of frequent and protracted courses of mercury, especially when administered in an adynamic state of the constitution.

This constitutes a numerous class of invalids in Indian society; and the rapidity with which many of them recover during a short residence at this station is very striking. Over such patients the cool and invigorating mountain air exercises a peculiarly congenial and restorative influence; and the beneficial operation of climate is in these cases aided by the abstraction from the cares and toils of official duty, by the opportunities for more frequent and active exercise, and by the novelty and grandeur of the scenery.

IV. *Bowel Affections.*—Experience has proved this climate to exert a prejudicial influence in those inflammatory affections of the colic mucous membranes, which constitute the common forms of chronic dysentery, as well as in the more strongly marked case, of chronic inflammation of the mucous tissue of the small intestines; but it may be recommended in the following forms of

bowel complaint. It is of considerable efficacy in those cases of diarrhœa, which, being unconnected with any obvious organic lesion of the component tissues of the bowels, are supposed to depend upon more relaxation of the exhalent vessels, which may either have been the primary affection, or may have supervened to a state of debility of the general system. This species of diarrhea, it must be added, is rarely met with in India.

There is an interesting form of bowel affection of not unfrequent occurrence in this country, which generally presents itself in persons of a cachectic or strumous diathesis; particularly if they have been reduced by pre-existing disease. The evacuations are very bulky, of a pale drab colour, and of a pultaceous consistence, and do not indicate any morbid increase of the mucous secretions—they are frequent, and are generally passed between day-light and breakfast time, and again about sunset, and without much tenesmus—the digestive functions of the stomach are little impaired—there is a good deal of flatulent distension of the abdomen—a wan and sallow complexion—and (generally I think) a greasy moisture on the surface. The effects of the hill climate in bowel complaints of the kind are very satisfactory ; and it is in similar cases that I have observed the administration of sulphate of copper and opium to be attended with greatest success.

The pale colour of the evacuations might at first lead to the inference that there is a deficiency of the biliary secretions, and, in consequence, lead to the employment of mercurials. * Such a method of treatment, from what

* As far as we know any thing of the biliary secretions, we generally consider it to be *deficient in quantity*, when the mo-

I have observed, would be by no means successful. The disease, in fact, is frequently found to supervene to a mercurial course, administered in a cachectic state of the system.

There is one other modification of bowel-complaint, to which I wish briefly to advert. I allude to those cases of mucous diarrhea, which are accompanied, at some period of their progress, by a state of low inflammation and superficial ulceration of the lining membrane of the throat. This local affection of the throat, as well as the attendant debility and loss of flesh, are apt to usurp the principal attention, and are often attributed to a break-up of the general system. But in many of these cases it will be found, on minute enquiry, that, for some months previously, the patient's bowels had been relaxed, though his attention may not have been attracted to this irregularity, from the circumstance that this mild description of diarrhea generally confers comparative freedom from what we commonly term bilious feelings, until its protracted duration, or augmented severity, entails a progressive falling off of flesh and strength, and incapacity for any kind of exertion. In bowel-complaints of this nature, which appear to be most prevalent at stations near the sea coast, the climate of the hills has a beneficial influence.

V. Chronic Disease of the Liver and Spleen.—Functional derangement of the liver and spleen passes, in general, by such slow and insensible gradations into

tions are costive, scanty, of pale colour, and clayey consistence: states very opposite in every thing but colour to the appearances described in the text.

organic disease, that it is often very difficult to draw a line of demarcation between the two, and to say when the one ceases and the other commences. Even when we are enabled, from the symptoms, to decide that structural alteration has taken place, there remains the difficulty of judging in what that alteration consists—whether there be enlargement or diminution of volume, induration or softening of tissue; and whether the chronic inflammatory action, which has given rise to these effects, is still going on, or whether it has subsided.

Such are the difficulties which embarrass us in forming our diagnosis, and consequently in making a skilful application of climate. In the slighter and more chronic cases of hepatic and spleen disease, where all inflammatory symptoms have subsided, or where the inflammation is of the asthenic kind, and the capillary vessels would appear to have got into a state of passive distension—in such cases, under the general tonic influence of the climate, the relaxed vessels may recover their healthy elasticity, and propel their contents with their accustomed energy, and thus the hypermia may subside, and the organ recover its normal structure. But, on the other hand, the increased arterial excitement, which may thus tend to re-establish healthy action and accelerate recovery, may, under a greater amount of disease, or at a less advanced stage of reparation, have the contrary effect of agravating all the symptoms. Not an unusual occurrence in such cases is, that, after the patient has resided here for two or three weeks, and is steadily improving in flesh and strength, the enfeebled vessels of the affected organ do not keep pace in the recovery of their tone with the increasing sanguification and aug-

mented impetus of the circulation; and he experiences, in consequence, a sub-acute inflammatory attack. By repeated small topical bleedings, and by abstemious diet, this is recovered from, and convalescence advances anew.

I would, however, be considered as expressing myself with great caution on all such cases. Few of them succeed, and only such as are unaccompanied by any evidence of morbid vascular excitement, general or local; and in all of them there must be the exercise of considerable precaution, on the part of the patient, both as regards diet * and exposure. Without such precaution, the inevitable effect of the climate will be to aggravate the disease, and probably to bring on an acute attack.

VI. *Head-aches.*—Under this head we are obliged to include a variety of affections, agreeing with each other in the one circumstance that head-ache forms

* In illustration of the great benefit to be derived from a rigid restriction of diet in organic diseases of the liver, the late Dr. Gregory was accustomed to mention, in his lectures, the cases of some European officers, who, during an imprisonment of several years at Seringapatam, completely recovered from hepatic diseases of long standing. A very striking case, illustrative of the same principles, has come within my own observation. An officer had a severe attack of hepatitis, which compelled him finally to go to England. After a two year's residence at home, without any improvement, he sailed again for India, and during the passage was wrecked on a desert island, where he remained for several months, living almost exclusively upon penguins eggs during the greater part of that time. Under this regimen, in spite of exposure to the weather and the privation of every comfort, his liver-complaint left him, and has not since returned.

their most prominent symptoms, but differing most essentially as to their pathological cause. The extreme difficulty of distinguishing in practice between cases which are strictly neuralgic and those which depend upon organic cerebral disease, must be acknowledged by every practitioner. Examples every day occur of head-aches which are considered as neuralgic or periodical, and which are successfully treated upon this principle, (thereby confirming the practitioner in the accuracy of his diagnosis,) in which there is frequently found after death extensive structural alteration of the brain. In other instances, a similar concourse of symptoms is met with; a similar plan of treatment is adopted; and on inspection after death no appreciable lesion can be detected.

Until therefore we shall have attained such precision in our knowledge of the pathology of this highly interesting class of affections, as to be able to refer each particular case to the special lesion on which it depends, we must be satisfied with retaining an arbitrary arrangement founded on symptoms alone. The following is the result of my experience of the influence of the climate on the different modifications of disease, of which head-ache forms the characteristic feature.

1. There are certain cases of what commonly go under the denomination of nervous head-aches, to which females are particularly subject, and which are generally exasperated in the hot seasons, especially in situations where hot winds prevail. They are not necessarily attended with any very marked derangement of the digestive functions. Such cases derive striking advantage

from the climate, aided merely by due attention to the state of the bowels.

2. There is a second set of cases which, whether they be strictly symptomatic or idiopathic, are manifestly aggravated by disorder of the digestive organs, and are most successfully treated by remedies directed to its correction. There is frequently a combination of head-ache and vertigo which sometimes succeed within a few hours to an irregularity of diet; while at other times, without any imprudence of this kind, they are preceded for some days by fulness and oppression at the epigastrium.

There seems reason to suppose that the head-ache in some of these cases, probably in the majority of them, is merely symptomatic of disordered digestion; but in others, however they may have been brought on, or aggravated by accidental indigestion, there has been subsequent evidence of the existence of organic disease in the brain, as their pathological cause. Yet in both modifications the same plan of treatment has been successful; and in both the climate of this station has had a most beneficial effect, probably from conducing to a more perfect performance of the digestive and assimilative functions, and thereby to a more healthy condition of the cerebral organs.

In illustration of the observations which have been made under this head, I may mention the following very striking case of an officer, in whose family apoplexy was hereditary, who was subject to very alarming attacks of vertigo, which generally came on during sleep, and more particularly after a late dinner. By changing his dinner hour he had no return of giddiness; but whenever he suffered from a bilious attack, from a common catarrh, or

from any other local or general disorder, affection of the head was always a prominent and distressing symptom. The restorative effect of the mountain climate, during the several visits which he paid to this station, was most striking. He rallied on each occasion within a few days, and enjoyed a vigor of health and exuberance of spirits which he scarcely experienced even in England. It is to be remarked, also, that for the removal of the affection of the head, a combination of mild aperients with tonics was found more effectual than depletion. Within two years after his return to England, this officer had an attack of apoplexy, which proved fatal, with considerable organic disease of the brain.

3. In a third set of cases, the head-ache is periodical, and assumes in every respect the appearance of a neuralgic disease. It may come on in irregular paroxysms, or it may recur every day, generally towards evening. In many cases the head-ache is principally complained of at the principal lunations, and in close sultry states of the weather. The occiput and forehead seem to be most commonly the seats of pain ; and there is frequently some degree of tenderness of the integuments over the affected part. Sometimes a little feverishness is present : but this is not generally the case.

The few instances of this form of head-ache which come before me at this station, have all recovered under the influence of the climate, and of treatment by quinine, aided occasionally by minute doses of oxymuriate of mercury. Where the disease has been strictly neuralgic, the success of the treatment, both as regards climate and medicinal remedies, can be satisfactorily accounted for : but where the intermitting head-ache is a symptom of

internal organic disease, the rationale of its efficacy is involved in great obscurity. It is probable that the primary source of disease, in many even of the latter description of cases, is seated in the nervous system, which gives rise to frequently recurring irregularities of the cerebral circulation, and thereby leads eventually to structural lesion. On this principle may be explained the beneficial effects of quinine and other tonics, in combination with other remedies directed more particularly to the vascular system. The following case, in relation to this subject, is one of great pathological importance.

An officer, aged about 28 years, of rather a plethoric habit, had been subject for eighteen months to the frequent recurrence of distressing head-aches, for which he had used a variety of remedies, principally of a purgative nature, without any good effect. He arrived at this station on the 10th January 1833, and then complained to me of daily paroxysms of a dull, heavy pain, affecting principally the back part of the head. They commenced in general toward evening, and continued during the early part of the night, though they sometimes did not subside till the forenoon. His general health was good. He was ordered quinine mixture, with a small dose of oxymuriate of mercury, twice a day. On the 18th, the headache had left him, and on the 27th, he left the station quite recovered; and continued free from head-ache for the following six months. On the 30th July, he had severe throbbing pain in the temples and forehead, for which he was freely depleted by Dr. Mearns, to whom I am indebted for the subsequent history of the case. On the 31st, he was seized with hemiplegia of the left side and loss of speech. On the 2d August, he had lost the

motion of the right arm; he became comatose on the 3d; and died on the 4th. On inspection, there was considerable vascular turgescence of the membranes of the brain, with a quantity of coagulated blood in the sinuses. The cerebral substance was very firm, and there was considerable serous effusion in the ventricles, and also under the base of the brain and cerebellum.

Assuming that the firmness of the cerebrum amounted in reality to a morbid lesion, there are obviously two ways in which the above and similar cases may be viewed. The long continued periodical head-aches may have been strictly neuralgic (functional), and the organic disease may have commenced at a subsequent date, the predisposition having been given, perhaps, by the previous functional disorder; or the head-ache may have been all along an intermittent symptom of a then existing permanent lesion. The latter seems the most probable conjecture; and in cases of frequently recurrent, and obstinate head-ache, arising from slight causes, or sometimes without any obvious cause at all, it is the opinion which it will be the safest to adopt in practice: for, though the morbid action may have been strictly neuralgic at its commencement, its long continuance will in all probability be followed, sooner or later, by organic change. This view of the disease will lead us to watch the case narrowly, and to correct general or local plethora when it may exist; and it ought not, I believe, to prevent us from the guarded use of tonics, when the state of the circulation does not contraindicate their employment. Such treatment is, in fact, occasionally found beneficial after the use of depletory measures ceases to have any good effect. A female, after exposure

to the sun, was seized soon after her return home with acute head-ache, of which she had had a similar and dangerous attack seven years before. Purgatives and the application of leeches not having afforded any decided benefit, she was freely bled, with complete relief. In two days the head-ache returned, with irregular paroxysms of fever. Leeching and blistering were then had recourse to, and she was brought under the influence of mercury, but with very little benefit. She came under my care a month after her first seizure, and then complained of a dull pain, and a sensation of very great weight, over the top of the left parietal bone; and she had generally along with it an unpleasant feeling of tingling and numbness in the left arm and leg, and she had irregular paroxysms of heat and dryness of skin. A variety of treatment was had recourse to with only temporary benefit; and latterly the application of leeches, (which formerly gave relief,) or of a blister, produced very unpleasant sinking at the epigastrium, without allaying the pain. Under these circumstances, I prescribed a light bitter infusion ; and when the pain and weight of head, and tingling of the left side, were much complained of, I had recourse to dry cupping of the back of the neck, with striking benefit. Even during the application of the cups, she described them as " removing the weight altogether, and drawing the pain from the head down to the shoulder ;" and the tingling subsided after two or three applications. She left the station after a four months' residence, quite free from head-ache, and in the enjoyment of excellent health; but had subsequently several returns of it, though not to the same extent.

This case exemplifies the advantage of tonic remedies, and a tonic climate, in a case in which I am satisfied there was, and still exists, organic lesion of the brain.

I am unable to define the particular descriptions of head-ache which are aggravated by a mountain atmosphere. They are most generally those which are connected with general or local plethora, and which require antiphlogistic treatment. Nor have I observed any benefit in cases of what is termed rheumatic head-ache, or in those painful affections of the forehead which are often denominated pseudo-syphilitic, or which arise from exposure to cold during a mercurial course. All such will probably be more relieved by the sea air of the coast.

VII. *Chronic Rheumatism.*—The success of medical treatment in chronic rheumatism is confessedly uncertain and unsatisfactory; and the same remark applies to the agency of climate. When the disease is perfectly chronic, and when it occurs in a debilitated, or in a cachectic, state of the general system, unaccompanied by any feverish tendency, or by morbid irritability of the bowels, the effect of this climate may be expected to be beneficial, provided the residence of the patients be not protracted beyond the third week of May. Rheumatic patients from Bombay have a very good opportunity (on their way to the Hills) of trying the effects of the hot sulphureous springs at Dasgaum, which have not hitherto received the attention they deserve, both in this and in other diseases.

VIII. *Ulcers.*—It has been stated by M. Hipp.

Cloquet,* that the cicatrization of wounds takes place more slowly at the hospital of the convent of St. Bernard than on the plains. This does not accord with the result of my experience at this station : on the contrary, I have found the climate exert a very beneficial effect in healing indolent and irritable ulcers of the lower extremites, which had been found intractable in the low country. Its efficacy is probably indirect, by correcting the disordered state of the general health, upon which many of these cases depend.

IX. *Diseases of Females.*—It is upon this class of patients that the salutary and restorative effects of the mountain climate have been most generally and conspicuously exerted ; and it is to them and to children that it may with most confidence be recommended. All the observations, therefore, which have been made regarding the favourable influence of the climate in the different classes of disease specified above apply *a fortiori* to females. While the peculiarity of their constitution enables them to reap the full benefit which the tonic and stimulant qualities of the atmosphere are calculated to impart, it at the same time protects them from most of the inconveniences which, as we have already seen, are apt to accompany the operation of the climate upon the other sex, unless counteracted by great care and precaution. Almost all the numerous and varying modifications of disorder arising from, or consistent with, functional derangement of the uterine system, unaccompanied by organic disease, are more amenable to medical

* Quarterly Journal of Foreign Medicine, May 1820.

treatment here than they are on the plains. The climate is also of considerable efficacy in the varied forms of functional disorder dependent on spinal irritation.

X. *Diseases of Children.*—The improved complexions, and increased activity and strength, which children acquire at this station, afford satisfactory evidence of the beneficial operation of the climate upon their constitutions.

The period of dentition, which in India proves fatal in so many instances, and in others lays the foundation of subsequent suffering and disease, is here, in general, completed with comparative ease and safety. A change to this climate is generally attended with good effect in the cases of feeble, relaxed, and delicate children, whether the debility be congenital (as in scrofulous habits), or whether it be the sequela of previous disease It is also beneficial in the early stages of marasmus, before the mesenteric glands have become involved in disease to any great extent.

This concludes our account of the application of the climate to the alleviation or removal of disease. It remains to look at it in only one other point of view—as a means of preserving health. The benefits of the station in this particular are generally acknowledged, and have already been very widely diffused. The opportunities which it affords to a large portion of the society, more especially to ladies and their children, of escaping, with comparatively little trouble and expense, from the parching hot winds of the Deccan, or the relaxing and oppressive heat of the coast, and of spending the hot sea-

son in a temperate climate, are of incalculable importance, and, in many instances, enable them to remain in this country, when it would otherwise be imperatively necessary for them to proceed to England.

The climate of the Cape of Good Hope presents a highly interesting subject of investigation in relation to this station. It may be interesting, and not altogether irrelevant to the subject of our present enquiry, to conclude with a brief sketch of the comparative merits of the two climates. The following summary embraces the principal points of comparison, so far as I am enabled to give them from the data in my possession.

	Cape of Good Hope.		Mahabuleshwur.	
Mean Annual Temperature	67°	38′	65°	37′
Do. Daily Variation of Do.	12	74	9	34
Extreme Monthly Do.	37	50	34	50
Do. Maximum Do.	95	00	91	00
Do. Minimum Do.	38	00	45	00
Do. Range of Do.	57	00	46	00
Mean Difference of Temperature of successive months	3	61	2	23
Extreme Do. Do. Do	10	30	7	23
Mean Temperature of 3 hottest months	76	66	72	58
Do. Do. Do. 3 coldest Do.	58	13	63	17
Difference between 3 coldest and 3 hottest months	18	53	9	41
No. of months whose mean Temperature is below the mean annual Temperature	7			8
No. of Rainy Days	85			134
Mean Annual Amount of Rain	40	0	239	80

We cannot but be struck with the remarkable similarity which exists between the two climates in regard to temperature, both in the different means and extremes ofdaily and monthly variation. The principal difference, it will be observed, is in the distribution of heat in the different seasons. Thus the mean temperature of the

Cape summer is 4° 08′ higher than our hot season; while the mean cold of the three winter months at the Cape is 5° 04′ lower than what is experienced in the corresponding months of the cold season at this station. This excess of heat in summer, and of cold in winter, at the Cape, is to be ascribed to the greater comparative length of the days in the former season, and to their shorter duration in the latter; nor is there a regular succession of sea breezes (as there is here) to temper the heat of the Cape summer.

Thus far the advantage is in favour of this climate. Did we, however, possess the means of extending our enquiries into the comparative intensity of the solar rays in the two countries, the result would be found highly favorable to the Cape. I am quite satisfied that the in-door summer heat is more oppressive at the Cape than it is here; nor am I certain that the heat of the outer air is not frequently as great and as much complained of: but there is this important difference, that exposure to the noon-day sun exerts a much less pernicious effect upon the system, both in health and disease, than a similar exposure does here.

The hygrometrical constitution of the air is very different in the two countries. Though the rains at the Cape are periodical, and fall principally during the winter, yet there are more frequent showers in the other months of the year, than what is experienced at this station. There is no measurement of the yearly fall on record; but it may be estimated at 40 inches, and the number of rainy days at about 90, of which one half occur in the winter, one fourth in spring, and the remaining fourth in the summer and autumn months.

While our easterly winds prevail principally in the cold weather, the summer is the season of the Cape south-easters, which, in the neighbourhood of Cape-Town, frequently blow with tempestuous violence for several days in succession, and prove peculiarly uncomfortable to the invalid.

With two climates corresponding so closely in their constituent temperatures, it remains to examine the causes to which the Cape climate owes its undoubted superiority as a convalescent station.

1. The first advantage which naturally presents itself is the probable benefit to be derived from a double sea voyage, in proceeding to, and returning from, the Cape. I am fully impressed with the high value and importance of a sea voyage in particular diseases, more especially in highly acute and dangerous forms of remittent fever, in which it often constitutes our only hope of recovery. I am not unaware, also, of the remarkable uniformity and comparative temperateness of the sea air,* and its continued renewal by the uninterrupted movement of the vessel, and of the gentle and continued determination to the surface, and increase of the insensible perspiration, which are its usual accompaniments. I cannot, however, resist the conviction, that the efficacy of this agent has been somewhat over-rated. During a twenty months residence at the Cape, I was very much struck with the fact, that, of the numerous invalids who in that period arrived from the different Indian presiden-

* Between the Tropics the mean temperatue at sea is generally (according to Humboldt) 4° or 5° lower than the continental air; and the mean daily variation amounts only to 3° or 4°.

cies, comparatively few appeared to have made any very decided improvement during the passage : and as regards the return voyage, it is matter of common remark, that few persons land in India in better health than when they embarked ; and that some have even retrograded. To this it may be answered, that though no positive progress be made in the restoration to health, yet, by the gradual transition from an Indian to an extra-tropical climate, the system becomes gradually habituated to the change, and is therefore better prepared for deriving full benefit on landing. This gradual and imperceptible change, so much talked of, is in a great degree imaginary. The greater part of the voyage is occupied in traversing from one tropic to the other, where the heat is aggravated, particularly at night, by the small, low, and imperfectly-ventilated apartments: and during the short time which elapses after the ship gets beyond the southern tropic, the temperature sustains very often a greater depression than what is experienced after landing. To this remains to be added the tedium of the passage, want of the accustomed exercise, imperfect protection against bad weather, and discomforts attendant on a sea voyage, which, though trifling individually and not felt by a person in health, are peculiarly harassing to an invalid.

2. The climate of the Cape is principally the result of its relative distance from the equator ; whereas that of this station is derived from its elevation above the level of the sea. This constitutes the grand distinction between the two climates; and hence it follows that the Cape climate has none of those stimulant qualities which arise from diminished atmospheric pressure, and is consequent-

ly adapted for many organic diseases, which would be aggravated by a mountain atmosphere.

3. Its extra-tropical position renders exposure to the direct influence of the sun at all seasons less injurious than in a climate of corresponding temperature within the tropics. An important consequence is, that the benefits of out-door exercise, throughout the day, are available for eight months in the year.

4. A residence at the Cape may be extended, under existing regulations, to a period of nineteen or twenty months; whereas here it is confined to eight.

5. The last advantage which the Cape possesses is, that travelling can be had recourse to during the spring and autumn, with shorter trips in the intervals of fine weather during the winter. The salutary and restorative effects of travelling are universally admitted, and nowhere are they more pre-eminently exemplified than at the Cape, though there are few countries where the scenery is more monotonous, or where there are fewer extrinsic advantages to recommend it. Instances are every day occurring of invalids who, after having remained in Cape Town, or its immediate vicinity, for several months without any improvement, have started upon a tour into the interior, in a state of debility scarcely fitted apparently, to bear with impunity exposure to atmospheric viscissitudes, and the want of many of their accustomed comforts ; and have returned in the course of a month or six weeks in a state of comparatively robust health. The invalid, therefore, who visits the Cape for the benefit of his health, ought to travel in the spring and autumn, reside in the country during the summer, and return to Cape Town during the winter. The latter

forms, perhaps, the best winter residence ; but, from local position, its summer climate fluctuates between great and oppressive heat, and the chilling influence of the strong south-easterly gales, which are so prevalent in the summer months. As a summer residence, Stellenbosch offers many advantages. * It is somewhat warmer than Wynberg; but the air is softer, and the temperature more equable, while it has the incalculable advantage of being almost beyond the reach of the south-easters. These winds have been termed the "Cape Doctor," in allusion to the popular idea of their salubrity ; but, however harmless or even salutary they may be to the healthy and seasoned resident, they prove peculiarly chilling, dry, and uncomfortable, to the Indian invalid, and, as far as my observation went, exert a pernicious influence on his health.

6. The Cape climate may be recommended for almost all the diseases that are usually met with in India, except rheumatism or organic diseases of the lungs, both of which are almost invariably aggravated by it. The former may be considered the endemic of the Cape ; and pulmonary affections are very frequent and fatal among the residents. Remittent and continued fevers are not uncommon, but they are in general easily managed; and intermittent fevers are unknown. Bowel-complaints are of frequent occurrence during the autumn.

Malcolm Pett, Mahabuleshwur Hills,
October 1836.

* The invalid who may take up his residence at Stellenbosch will have the benefit of the medical advice of Dr. O'Flinn, who is not only one of the ablest physicians in the colony, but who practises his profession with all the ardor and zeal which so eminently characterize the Parisian Medical School.

A

REPORT ON THE DISEASE

WHICH

PREVAILED IN KATTYWAR AND IN PARTS OF THE ZILLAH OF AHMEDABAD IN THE YEARS 1819-20

ADDRESSED TO THE

SECRETARY OF THE MEDICAL BOARD.

BY

THOMAS WHYTE, ESQ.

Presented 12th Nov. 1836.

I have now the pleasure to acknowledge the receipt of your letter, dated the 19th February, directing me to institute some enquiry into the nature of a disease, said to be contagious, now raging in the neighbourhood of Kattywar, and districts subordinate to the collectorate of Ahmedabad. I was already moving, for this purpose, in the above direction, at the time of my receiving your letter, and shall first submit for your consideration, a kind of journal of the principal facts, which I collected in the places which I visited, and afterwards, such remarks as a careful consideration of these facts, has produced.

The town of Morevee is a large place, surrounded with very high walls, situated pretty high on the bank of a fine river. Neither in it, or its neighbourhood, do there

appear to exist, any of those causes which are understood to produce the common intermittent fevers of this country ; and the character of the place has, in general, been remarkable for health. The whole space within the walls is, however, crowded with houses, and, although the population at present is very thin, they were probably filled with inhabitants, before the place was visited by famine and sickness. The disease, which is the subject of this paper, distinguished all over this district, by the general name of "*Ghant*," (and which from the exact similarity, between the symptoms of that now raging at Moolee and Sila, and those described as the common appearances in 1817, is unquestionably the same disease,) prevailed for five months in this town, three years ago. It began in the cold, and lasted through the hot months, without undergoing any change from the change of weather. It is, in general, stated to have carried off fifteen hundred people, which account, I should think, is exaggerated about two-thirds above the actual number. It must remain a subject of conjecture, however, for the different statements vary so much, as to set all accuracy at defiance. The same doubt exists, regarding the proportion between the deaths, and recoveries ; some declaring that one in ten recovered, others that not one in fifty did so ; and a barber-surgeon of the town informed me that two thousand recovered, and two thousand five hundred died. He said, he never meddled with the patients, till after the fifth day, when, it is probable, the principal part, or whole of the danger was at an end. His practice consisted entirely of hot stimulating applications to the buboes ; he gave no internal remedies. I saw and examined four

of the recovered men, which number, although so small, seemed to be procured with difficulty, and may serve to show how few actually survived. In the houses of the three first, no other person had been affected; in two there was no more than one bubo; the third had three; and of the whole only one suppurated. The fourth was a Mussulman who took care of cows, and sold milk and ghee; his house, from his description, was very close and ill aired, and of nine, composing his family, seven had been attacked by the same disease; he was first taken ill, two were seized two days after, and the rest successively at about an equal distance of time. Three died, and four recovered. They all had first, a severe fever, which deprived them of their reason on the second day. In all who recovered, the consequent debility was very great, and convalescence extremely slow. None of these four men entertained the smallest suspicion of contagion. One said, he could not tell how he caught the disease, unless it was from his wife, to whom he had been married about six months before, and who then had a little itch upon her thigh. He seemed to puzzle himself very much, however, in accounting for his illness, being not at all sure that his wife had been the cause of it; and the other three could assign no reason whatever. Indeed, no one in the town considered the disease as contagious, and the Thakoor, or Chief's brother, seemed to have proved very satisfactorily in his own person, that it was not so. He, with a laudable kindness and anxiety for the welfare of his people, had been in the habit of frequently visiting the sick, comforting them, enquiring into the nature of their complaints, handling and touching them, and all with complete impunity; from

which, I think, we may safely infer that casual intercourse is unattended with much danger. It is probable, likewise, that the disease is not readily communicated by the touch, and possible, that confinement to the same apartment is, in general, necessary for its production. The only part of the town which did not suffer was the Thakoor's palace. It is a very large, well aired place, elevated above the other parts of the town in a slight degree, and contains about one hundred people, all of whom enjoyed a perfect immunity. On the opposite side of the river, less than a quarter of a mile distant, on a very high and exposed situation, is a small village, called Moorba, not one of whose inhabitants was attacked, although a daily and hourly communication was maintained during the whole period of the above five months; the people say that the river set bounds to the disease. On the same side of the river with Morevee, disease was communicated to a village two coss off, called Moolee; but the situation of this village is low, close, and ill aired, being surrounded with jungle. It is more probable, therefore, that Moorba owed its exemption to its high and airy site, and that Moolee suffered from the opposite causes.

Wunkaneer is a large, walled town, situated at the foot of a mountain of considerable height, and on the bank of a very fine river, distant about eighteen miles from Morevee. While this disease raged at the latter place, it likewise paid Wunkaneer a visit, and the people say that it came from Morevee; it lasted no longer than fifteen days, and was almost solely confined to one class of people, viz. the Boras, whose occupation is the manufacture of cotton cloths. I am told that the

greater part of the cotton was imported from the surrounding country, and part of it from Morevee. The number of deaths was estimated at sixty among the Boras; and no more than four or five of all the other inhabitants suffered. These numbers, too, are probably correct, for the testimony of different people was nearly the same; and it is obvious that where the disease was so nearly confined to one set of people, it would be no difficult task to arrive at precision. Every one who was attacked, is said to have died. The Boras became so much alarmed at a visitation so dreadfully severe, and at the same time so partial, in which, every one of them, seemed to have been doomed to destruction, that they all left the town, and went to live upon the mountain in the neighbourhood, leaving only those that were sick, in their houses, and one attendant upon each of them; the whole of these very soon died. Whenever they heard of a death, the friends of the deceased came down and performed the last offices as speedily as possible, returning again to their abode in the mountain. Some of those who attended these funerals were taken ill, but not many could have suffered in this manner, for at the end of fifteen days, after their removal to the mountain, the disease had entirely disappeared from amongst them. When this was the case they all came down and occupied their houses, and they declare that after this, no person was attacked with the disease. This is a curious and singular fact, affording a rare instance of a measure dictated by fear, and carried into effect, without reason or reflection, being attended with complete success. In fact, it corresponds very nearly with what has been recommended to be done by

one of our best writers, Dr. Adams, on such an occasion; and is a very good practical illustration of the measures which, with so much care, deliberation, and strict induction, from the facts before him, he laid down, and thought likely to be successful.

In the town of Sura, I was told that a travelling merchant had come thither, and died, after six days' illness, from a fever accompanied with buboes. His wife had not been affected, and left the village shortly after. After the lapse of a month, a woman, of the caste that takes care of cows, was seized with the same disease, and died in six days. She lived in a different part of the village, to that, where the merchant died. Eight or ten days after her death, a woman of the same caste, and living in the same compound, was likewise seized with this disease, and died on the third day. Her death had occurred about twelve days before the time of my visiting the village, and up to this period no other person had been attacked. There were a great number of people living in the same compound, and both women had a number of children. The last who died had suckled an infant, till the time of her death.

Then a Banian's boy, who had come from Moolee, which is twenty miles distant, was here attacked with this disease, and died, but did not communicate it to any other person. The people of the province say, that this year, the disease appeared first in Limree, afterwards in Wudwaum, from which it came to Sila and Moolee. I visited the two last named places.

Moolee is a large and very populous town, the inhabitants being nearly all Rajpoots. It is surrounded with an old ruinous wall, full of breaches, which are all

carefully stuffed with thorns; and every house has a wall of the same materials, much higher than a man's head. No better means, could possibly have been adopted, completely, to exclude ventilation, if such had been, the sole object of the inhabitants; and it might fairly, be made subject for dispute, whether in shutting out their enemies, they have not shut in, one, far more powerful than the whole of them together. It is situated on the bank of a river, even now almost dried up, and the water of which, is perfectly brackish.

The disease had carried off in one month about eighty people, and was still prevailing. I saw a great number, who had buboes without any fever, and was told that upwards of one hundred and twenty had suffered in this way; these people walked about, without either alarm, or inconvenience, for none had died, and not many of the buboes had suppurated; not one however, with fever had survived.

There was a description of cases here, distinguished by fever, and hemorrhage, apparently from the lungs, without buboes; these were reported, to be as surely, and even more speedily, fatal than those, with fever, and buboes. This had been the most common form of the disease at first, but lately, had rarely appeared. Fortunately, one case came under my observation; I say fortunately, for I had frequently heard it described, both at Wunkaneer, and Morevee, without being able to understand what was meant; every narrator so mixing his account of appearances, and actual facts, with what he supposed to be their causes, and with the internal changes, which he supposed to take place, and immediately to produce death, that the descriptions became involved in a cloud of utter confusion.

In this man the heat of the body was not much increased, nor the pulse greatly accelerated; his bowels were not disordered, nor did his tongue indicate much febrile irritation; he was able to walk about, and converse, answering questions distinctly; no person would have thought him in danger; but there existed in the patient's mind, a degree of alarm, and anxiety altogether disproportioned to the apparent symptoms; he had only been attacked that morning, and all consideration seemed absorbed, with a pain in his chest; he answered to my question, whether he had not other pain, as in his head, his back or limbs, that these were slightly painful; but he immediately recurred to his chest, dwelling upon that, with a look of the most painful distress, and if not questioned about other symptoms, it seemed, as if he would not have mentioned them. He had besides, a very slight cough; so slight that it might easily have escaped unnoticed, and it was accompanied with a discharge of blood from the mouth. The following day he was delirious, had a burning skin, with a very quick pulse; I searched for, but found no buboes. He died in the course of the succeeding night, i. e. in less than forty-eight hours from the first attack. The characteristic symptoms of this variety, are slight cough, pain of the chest, and hemorrhage from the month, attended with fever, but no buboes.

I saw four other cases of the disease, all of which were marked by a low typhus fever, buboes in the groin, or armpit (and in one case, in the seat of the parotid, and submaxillary glands of one side). In all there was the greatest debility; and in one, a universal tremor of all the muscles of the body, giving a very singular appear-

ance. All complained of great thirst; the tongue was covered with a white fur in the centre, through which, and at the edges, were seen the papillæ of a shining fiery red appearance. In none were either *petechiæ or carbuncles* to be seen, and I may observe, that I have neither seen, nor heard described, either of these symptoms, nor any other cuticular affection; petechiæ might easily escape common observation, carbuncles could not possibly do so. In general, there is not more than one bubo, although in one of the above cases, where only one was visible, I distinctly felt hard, knotty swellings, in both armpits, and in the opposite groin.

All the above cases, as well as those of two females of rank, which were not shewn to me, terminated fatally, during the first, and second days of my visit, and no other cases occurred during my stay.

They had not, the slightest opinion in the place, of the disease being contagious: indeed, they were determinately of opinion, that it was not so. One man, the Thakoor's brother, confidently assured me that contagion was not the cause of the disease, affirming boldly that no man could be a better judge of the question, for that none, had greater experience, he having lost in his own family, eight women, and one boy. "No no," said he, "oorta jooda;" contagion is quite a different thing. Another woman died in this man's house while I was here, making a total of ten, in his house.

Nothing can show more clearly the evil arising from bigotted prepossession, than the case of this man's family; for it is difficult to conceive, what he would have considered as satisfactory proof of the reality of contagion. To the unprejudiced observer, the probability

will appear very strong, that these women caught the disease, one from the other, and that the boy got it likewise, from them; or, which is the same thing, that the atmosphere of the apartment where they lived, being rendered infectious by the effluvia of the diseased, proved afterwards the source of disease, and death to those, who were living continually, under its influence. These were women of rank, and the seclusion to which they have been doomed by the force of opinion, and custom is well known ; it operated so far, as to prevent, my seeing the two women mentioned above, as having died, one of whom belonged to this family.

They sometimes said that this was no disease, but an order from the Almighty, to remove whomever it attacked; therefore probably, all resistance was thought, to be, wicked or vain; it is to be feared, that this belief in fatalism will prove an insurmountable bar to the execution of those measures, which alone promise to be effectual, in checking the progress of this scourge. I tried, and exhausted all the means of argument, and persuasion at this place, without the smallest benefit ; nothing, I am afraid, but the strong arm of power will avail, and direct authority in these towns, we do not possess.

Sila is a large walled town in the neighbourhood of an extensive tank, which supplies excellent water. The disease had prevailed there, about two months, and a half ; at first it had had been very severe, and general, but lately it had become more partial in its attacks. The same class of people, viz. the Boras, that had suffered so much, at Wunkaneer, were likewise the first attacked, and had suffered, in a proportion, greatly beyond that of the other classes : one hundred and twenty were said to have died, of whom, sixty were Boras. In some particu-

lar houses, the loss had been very great; some losing five, and others eight or nine, of their inhabitants. At one time, they thought the disease, contagious, for people returning from a funeral had been suddenly attacked, and carried off, but lately it had lost, in their opinion, this character. One of the houses said to have suffered particularly, was an *oilman's:* five people died in it. I was told, in Moolee, that one man of the same profession had died; the total number of people of this description living in Sila, is said to be fifty; in Moolee thirty. I was here shown the cases of four people, in advanced stages of the disease: they were the only survivors, and only one, appeared to be in any danger, or rather in any doubt, for in her case even, the danger appeared to be nearly over.

She was in the ninth day of the disease, had a bubo in the upper part of each thigh, both very painful to the touch; they appeared on the second, or third day of a fever which had deprived her, for a time, of her senses: even at this time, her mental powers were so weak, that she found it difficult to command attention to any subject, and her memory seemed frequently to fail her; she was exceedingly weak in body as well as mind; her eyes had a glassy appearance, and one was partially suffused with blood. A very severe purging had just terminated, after some days duration; she had likewise suffered much from copious, and universal sweats; but both these symptoms, from the period of their appearance, seem to have been the prelude to improvement. She is ignorant as to the cause of her disease; it was not in her immediate neighbourhood at the time, and has not apparently been communicated to any other person. She lies in a

veranda, the front part of which, is closed up with a wall of *Kirby stalks*, * and several *calves*, as well as men, women, and children, are her companions in this apartment.

2d Case. A poor woman in a very low, and wretched hovel, with only one small aperture for entrance; she had suffered severely from fever, but is now free from it; has no recollection of any thing that befel her, for several days; has one bubo a little below the groin. She had attended a woman, who died of the same disease; has not communicated the disease to any other person, but appears to live almost entirely alone.

3d Case. A boy with a large, irregular bubo of a livid, gangrenous appearance, occupying the whole cluster of glands, at the upper part of the thigh, and discharging a thin ichor; does not know, how he caught the disease, had been insensible for some time, but says the bubo, and fever came on together; he lies in an open veranda fronting the street. Both this and the former patient are very weak. Judging from the hardness, and quantity of dirt accumulated, on this boy's skin, he cannot have washed his body, for years.

4th Case. A *Dher* † woman with a large bubo in one arm pit, the top of which is covered with a white slough. The bubo has a gangrenous appearance; but she says, she has not had any fever. No other person has had this disease in the *Dherwaree*, ‡ which is a large and populous place, close to, but outside, the walls of the

* The Straw of the *Holcus, Spicatus or Holcus Sorghum.*

† The *Dhers* are people of low caste.

‡ The part of a village inhabited by the *Dhers.*

town. There were not many of these wretched outcasts in the towns named above, and they had not, I believe, a separate place assigned them, as in the present instance, but lived within the walls.

A Banyan's wife had just died in the town, on the ninth day of her illness ; she had a bubo on one side of the neck, the inflammation, and swelling from which had extended over to the other side, appearing to occupy the whole throat. Her brother had died a little before her, in the same house, on the third day. There were no fresh cases at present in the town, and the disease was thought, to be on the decline.

On its first visitation, that form noticed above, as distinguished by fever, slight cough, pain of the chest, and hemorrhage, had been the most common : but it had disappeared for some time. This variety seems to have appeared first, at every place, which has yet been visited. I may remark, that the famous *plague of Athens* is said to have been ushered in by an epidemic catarrh, or pleurisy, which yielded to no remedy, and which gradually gave way to a fever, accompanied by the true pestilential tokens. In the town of Sila only seven or eight are said to have had "*tunda ghant*," or buboes without fever.

Before proceeding farther, it seems necessary to take notice, of some peculiarities of the people, in this province, which, in my opinion, exert a powerful influence over the progress at least, of this disease. *They are the only people, whom I have seen in India, who might properly be termed filthy.* Ablution, which, from being sanctioned, and enjoined by divine authority, in every other place, is practised, with all the diligence, and scrupulosity of their other religious ceremonies, in Katy-

war, from what cause I know not, is almost wholly neglected. The evil consequences of this neglect, are much increased by the enormous quantity of clothes, which it is the fashion, for all ranks, to wear; and in most ranks, these clothes are but seldom changed. In some of the inferior, it seems almost, as if they were allowed to rot, upon the persons of their owners, without once being washed, or even removed from their first being put on, till they can no longer serve the purpose of covering their nakedness. Another common practice in most parts of India, friction of the body with oil, which might, in some measure, have counteracted the evil consequences of the other neglect, is, unfortunately here, also, in equal disuse. This very grateful, and salutary practice which, by encouraging, and at the same time modifying, the process of perspiration, has so powerful an effect in regulating the temperature of the body, as well as in preserving the balance of the circulation; and by preventing cuticular absorption must prevent the admission of contagion into the system, in that direction, has, upon very good authority, and extensive experience, been supposed a complete preventive, as well as a powerful agent in the cure of plague. If this disease is *Plague*, some of the facts, above related, are sadly at variance with this opinion. I hope, however, I may not be accused of giving way, too far, to prepossession on the present subject, if I declare that my opinion, of the efficacy of this practice, has not been much shaken by them. The facts were not witnessed by, but reported to me, and I had dwelt so much upon the necessity of ablution and oily friction in my conversation with the inhabitants, that I shall not be much sur-

prised if, when I inquired regarding the oil manufacturers, they had invented these circumstances to excuse to themselves, and me their own apathy, and neglect of the precautions which I had pointed out. If this disease is communicated by the touch, there can be no more powerful antidote than oily friction; but where infection is received with the breath, it will be efficacious, only in so far, as it invigorates the general system, and enables it, to resist the influence of disease.

In addition to the above causes, which are permanent, it is likewise certain that, for some time past, the great body of the people have laboured under all the depressing disadvantages of precarious existence. It is not, for me to investigate, the political causes that may have been agents, in reducing the country to its present state. It is probable that they were, in a great measure, unavoidable, impossible to be foreseen, or effectually prevented.

The country has, in a short space of time, undergone a most complete revolution; the tide of public authority, has on a sudden been diverted into a totally new, and totally different channel. The hundreds of little Lords who once enjoyed perfect and independent authority in their own little districts, have, by this revolution, been deprived, of every thing but the name of independence. It is not therefore, to be wondered at, if those districts should for a time, feel the want of that fostering influence which once protected them, and to which they were attached by every tie.

The severe famine which visited this province, gave an influence to the above causes, which otherwise, they would never have acquired: the one thus aiding the other, both gained an increase of force. Indeed, pes-

tilence, and famine have so constantly gone together, and are so linked even in our speech, that a sentence seems incomplete, where one is pronounced without the other.

The consequence of all this has been, general distress, general despondency, and general inactivity : every town swarms with idlers, than which, no more fertile source of disease, exists ; its effects are so powerful, that they may be traced even in individual instances ; but where indolence, and inactivity affect a whole community, the consequences then force themselves, upon our notice.

In Kattywar, industry is unknown (in many places it is beginning however to revive,) and that chiefly, in the districts where this disease has raged. Cultivation is almost neglected, and the inhabitants depend, for the means of subsistence, principally upon the milk, and ghee furnished by their cattle. Partly from this cause, and partly from the strictness of their religious tenets, which rigidly forbid the death of any animal, every family has accumulated a large stock of cattle ; and these, amounting to hundreds, or thousands, according to the size of a town, are invariably driven within the walls at sun-set, and are penned for the night in the same house, which contains the rest of the family. Thus no limits are set, to the number of cattle accumulated in every family, excepting by death, the consequence of disease, or old age.

Still all animals are doomed to die ; and, notwithstanding the humanity of religious tenets, this forfeit must be paid, in one way or other. In proportion therefore, as we diminish the number of deaths by artificial, or

violent methods, we should naturally expect an increase, to the number by natural causes; or, in other words, that disease, and sickness would be multiplied. Accordingly we find this to be the case; the cattle of Kattywar afford the clearest proof of it; few seem altogether free from disease, and many are seen in the most wretched condition, crippled, and crawling about with swelled legs and diseased skins.

The degree of obscurity which hangs over the origin of most fevers, can seldom be removed by years of the best directed inquiry; thus after so many years of observation, and experience, during the whole of which, the eyes of an enlightened public, have been diligently directed to the subject; the causes which produce the annual fever of North America is still a matter of doubtful discussion. The same remark is applicable to the *yellow fever* of the West Indies; some still attributing it to contagion, others entirely to local causes.

We are completely in the dark, likewise, regarding the origin of almost all the specific contagions. Of one—the *cow-pox*—we cannot be in doubt: and many are of opinion, from the great similarity in many points, that small-pox, originally took its rise, from the same source.

It may perhaps facilitate our inquiry, into the cause of the present disease, distinctly to point out, what at least, have not been agents in its production. We may then at once, and altogether exclude from consideration all putrifying animal, and vegetable substances, all effluvia from jungles, and marshes; for every one of the towns, that I have visited, are in a remarkable degree, exempted from every thing that could pro-

duce these; their situation being either, on the rocky bank of a running stream, or on a dry sandy soil.

Leaving these causes therefore, out of sight, we may now observe, that another cause of fever, at once the most common, and the most destructive, has been clearly, and indisputably ascertained—*I mean the cause of infectious or typhus fever.*

We know that wherever a number of human beings are crowded, and confined within a narrow space, where the atmosphere which they breathe, cannot frequently be renewed, where the effluvia from their bodies remain undiluted, are allowed to accumulate, and attain a sufficient degree of concentration, then the atmosphere which is loaded with them, will excite, in those, who live within its influence, *a fever of the most malignant nature.*

This fever, (from the places which have in general, been most favourable for its production,) has been called "*gaol,*" "*hospital,*" or "*ship*" fever. Now I apprehend, that it will be difficult to find a situation more likely, to give rise to such a fever, than many of the above walled, and crowded towns will furnish. If we consider the manner in which man, and cattle are crowded in the same narrow, unventilated spaces; that many of these cattle are labouring under diseases, regarding the nature of which we are ignorant, (an epidemic, or contagious disease has since the famine, run through the whole of them,) that further, every predisposition is augmented by the listlessness, and despondency impending over the people; it will not appear improbable, that disease should arise; indeed it is rather naturally to be looked for, and expected.

From an atmosphere thus deteriorated, partly by the accumulation of human, and partly by that of diseased brutal effluvia, we would expect a disease "*sui generis*," or at least, if resembling infectious fever, modified by the peculiarity of its causes; in fact, specifically different. If then, the causes which produce this disease, are local, and exist in the places where it has made its appearence, it is probable that the above unnatural association, and seclusion of man and cattle, in close situations within walled towns, may be assumed as their source. I offer this however, only as conjecture; and it will be received either as probable, possible, or absurd, according to the degree of credence which it may deserve.

I am more inclined to believe, *that the disease was imported into this country,* and with this belief, that of the people in general, coincides. There appear to me to be a great many facts which powerfully support this view, and which could not satisfactorily be accounted for in any other way. It is not known, to have attacked any two places simultaneously, however much alike in those local causes, of which, we have already admitted the probable influence; after appearing in one town, it went after a little time, to the town nearest, as from Limree to Wudwan, Sila, and Moolee this year; or from Morevee to Wunkaneer in 1817, affecting slightly the intermediate villages.

The class of people first, and principally, affected both at Sila, and Wunkaneer, affords an additional presumption, that in these instances, the disease was imported; for it is in every way probable that the cotton was the vehicle, by which the contagion was conveyed.

The sudden disappearance of the disease from Wunkaneer, upon the separation of the healthy, from the sick part of the people, cannot be satisfactorily accounted for, by any other supposition than that of imported contagion.

If local causes had produced the disease, why was their operation not evident again, after the return of the Boras to their houses, for in so short a space no improvement in their condition, could have taken place, unless a diminution of their numbers, be considered as one? Under such circumstances again, the fact of the disease disappearing, and re-appearing after the lapse of years, cannot be accounted for. It is probable that, during the period of the disease being absent, these local causes remained much the same; but on the other hand, if we believe in imported contagion, the difficulty is at once removed.

If we consider the nature of *fomites*, we shall at once understand how they may lie inactive for any length of time, and then, probably by some accident be at once brought into action; it is well known, that *fomites*, so far from losing their power by time, will, if confined, acquire a great increase to it.

Dr. Parr says, that the last time the *Plague* appeared in the town, where he was writing, (Exeter,) it arose from a traveller remarking to his companion, that formerly he had been confined by the *Plague* in the room where they were then sitting. "In that corner," said he, "were the dressings kept; it is now plastered, but probably they are there still." With a poker he broke down the plastering, found the dressings, and the disease was soon extensively disseminated.

We may the rather wonder, that the disease is so seldom produced, or so seldom conveyed from one country into another: this, indeed, is a mystery which it is impossible to solve. *Quarantine* alone (considering the careless manner in which goods are ventilated) is insufficient to account for the long exemption, which England has enjoyed.

In Bombay, where none is practised, although a constant intercourse is maintained between that port, and the Red Sea, how shall we account for the disease, never having been imported.

A Dr. Lind (*in the Medical and Physical Journal*) says, that *plague* has frequently been introduced into Surat from the ports in the Red Sea, but has never spread, "owing to the inha bitants living in a constant stream of air." *Upon what authority this assertion was made, he does not inform us.*

Quarantine, I am informed, was enforced in the town of Dundooka this year; notwithstanding which, the disease made its appearance there. However, as it is probable that the authority was not sufficient to prevent the introduction of goods, (however easily people from the infected towns, might have been excluded,) no inference can fairly be drawn, from this single instance.

In the mean time, it is certain that the disease has been introduced into many villages, and even towns of a considerable size, (Than is a large walled town, and otherwise favorable for its progress,) without having spread.

Dr. Russel had frequent occasion to remark a similar circumstance, and, without untying, seems to have cut the knot, by the gratuitous supposition of a *pestilential atmosphere*. After having mentioned a variety of instances

where the disease was introduced, and yet did not spread, he says, its *fomes* without a *pestilential atmosphere*, is insufficient for the production of the disease ; which atmosphere approaches by slow, silent, and imperceptible degrees; no human barrier being able to oppose its progress.

We ought not, however, to deceive ourselves ; there is in the above sentence no discovery of a new cause; the question is merely stated in different terms ; we are not only ignorant as to the nature of this atmosphere, but even uncertain as to its existence. Allow it once existence, and some circumstances attending the history of this disease, which before were involved in impenetrable mystery, may then be solved in an instant. We can account for the disease having hitherto been confined to one strip of country, distinguished by a particular name, (Jalliawar I believe,) but by no other peculiarity from the towns or districts in its immediate neighbourhood ; for its coming close to the above limits, but never going beyond them : the *pestilential atmosphere* has not yet extended beyond the prescribed boundary?

In Europe, the pestilential atmosphere has, for a long time, been confined to the countries of Russia and Spain ; in Asia, to Turkey and Egypt. Until, however, we are acquainted with the nature of this pestilential atmosphere, we shall remain where we were.

Why is Turkey so subject to *plague* at the present day, although, when its countries composed the Roman Empire, they were almost always free from it. Sir John Pringle says, the principal reasons are, the frequent ablutions enjoined by the Mahometan religion ; while the

neglect of these in Kattywar has been thought a principal cause, of the inhabitants suffering, from a similar disease.

Nothing can show more clearly, the danger attending all reasoning, upon limited experience. All the countries above named agree in one general circumstance ; the inhabitants enjoy a less degree of that internal comfort, contentment, prosperity, and peace of mind, which constitute the sum of human happiness, (speaking generally,) than those, of the countries which are exempted from the ravages of this disease. England, probably, is indebted to her improved condition in the general diet, and manners of the people, for her long exemptions ; and the other countries will be equally safe, when their internal condition shall be improved.

From all that has been said, I think, it will be apparent, that although this disease, in a close, ill-aired situation, is highly contagious, in an open space it is quite the reverse. It has never remained long in any, except the large and walled towns, where probably, more or less of infectious atmosphere always exists ; while the town of Sila suffered so much, the *Dhcrwaree*, which was outside the walls, was free. *The Thakoor's house (the only one in the town, well aired) at Morevee, afforded safety to a hundred people, while the disease lasted for five months, in every other part of the town.*

The town of Moorba kept its inhabitants in safety, for the same reason, and all the villages in the district may be said to have been safe, for the disease never spread generally among their inhabitants ; and lastly, when from fear the sound part of the people were separated from the diseased, the disease which, while the Boras remain-

ed crowded in their dirty huts, within the walls of Wunkaneer, threatened their entire destruction, was immediately, and entirely removed.

No doubt can exist, that the disease was propagated by contagion, in the house of the Thakoor's brother in Moolee, where, in one family, nine women, and a boy died from it; or, in the house of the Boras in Morevee, where seven out of nine people, living in a dirty, confined house, were successively attacked by it.

I think it very probable, likewise, that the towns, which as yet have been safe, are every day liable, to have it introduced among their inhabitants by means of *fomites;* and that, if unfavorable circumstances concur at its first introduction, it will spread in any of those towns, whether they are placed within, or without the limits of Jalliawar.

The subject of prevention therefore, is one of the utmost importance, and it is cheering to reflect, that we have arrived at the knowledge of a plan, by which, if its rules are rigidly attended to, we have it in our power speedily to check the progress of this scourge, in any place where it may be introduced. These rules to be completely effectual however, require the aid of a vigilant police, guarded by sufficient authority: if the disease were introduced into this camp to-day, I would not be under the smallest apprehension of its spreading. Unfortunately, however, the nature of the petty authorities in Kattywar, combined with the apathy, indifference, and uncleanly habits of the people, their mental despondency, belief in fatalism, and perhaps neglect of oily frictions present very great, and perhaps insuperable difficulties, to the proper execution of the necessary rules.

Power is divided into so many minute portions, that it dwindles into almost nothing ; and an attempt to enforce that little, would subject the chieftain, to the risk of losing all his most industrious subjects ; these, knowing very well their own importance, if displeased, immediately threaten to remove into the territories of some neighbouring Lord, and thus render their own, a slave to their whims, caprices, and pettish humours. In consequence of this, the Chief, if ever so willing, would not possess sufficient authority, to enforce the necessary rules.

These, I need hardly add, are such as would secure cleanliness, and a complete separation of every family, in which the disease had appeared, from the remaining sound population ; they ought to be compelled instantly to depart from the town, and live in the open plain, under a temporary encampment, which (if the subject were thought of sufficient importance) might be erected at the public expense. For the lower orders, it would be well, if the clothes of the diseased were to be burned, at the public expense likewise. Experience has proved, that if not crowded in such a situation, the disease would not spread ; and, there can be no doubt, the beneficial consequences would soon be a subject of joy, and congratulation to every one who had a share in promoting so benevolent a purpose.

It would perhaps, have been better if I had at an earlier period said, what I now intend to do, concerning the nature of this disease, as I have, in many places, been compelled to anticipate so far, as to speak of it by a name, which I have no hesitation in at once assigning to it, viz. *Pestis*.

Doubtless, in former times, all severe, and fatal fevers were too indiscriminately classed under, and handed down to posterity, with this denomination: on the other hand, it has been the error of physicians, more frequently in latter times, altogether to doubt the existence of this disease, until its ravages had fatally, and too surely, pronounced its nature.

There is something so repulsive in the name of *Plague*, that our wishes naturally beget a disbelief of its reality; let us be cautious how we feed a belief which may be fraught with such dangerous consequences to hundreds of our fellow-creatures; but equally free from prejudice either way, let us dispassionately call in, the aid of nosological definition to guide us through the difficulty. It is I believe, allowed, that although a great many more symptoms frequently attend it, (and no disease has varied so much in various epidemics,) yet that Cullen's definition includes all, that are strictly pathognomonic—"*Typhus Maxime Contagiosa cum summa debilitate; incerto Morbi die, eruptio bubonum vel anthracum.*"

All these symptoms are present in almost every case of this disease, and are mentioned always by the natives as distinguishing it. The very name which they have given to the disease, "*Ghant,*" means literally a bubo. It is, indeed, true that *petechiæ* and *carbuncles*, if ever, are but seldom seen; symptoms commonly attendant on *Plague*: but we may observe, that *petechiæ* are not mentioned by Dr. Cullen, and that he mentions *carbuncles* in an ambiguous, and guarded manner, "*Bubonum vel Anthracum,*" which by no means implies their constant, and necessary presence.

It may be urged, likewise, that in one particular form, above described, no *buboes* are ever observed : but we learn from Dr. Russel, that the same thing was very common at Aleppo ; and he seems to think, that their non-appearance was owing to the rapid termination of these cases in death; this is extremely probable, for these eruptions do not come out critically, on a particular day, but "*incerto morbi die;*" and in the prognosis of this disease, the later they were in appearing, it has always been observed, so much the greater has been the danger, and *vice versa,* where they come out before the fever, the danger is seldom great. The same thing has always been observed, regarding the yellow colour of the skin in yellow-fever, where the patient dies very early in the disease, the yellow colour not having appeared. *Buboes* are the grand distinguishing symptoms of the present disease, and, if the patients were to live long enough, would, doubtless, invariably make their appearance.

I apprehend, therefore, we shall be as little justified in refusing it a place under the head of *Plague,* as those authors have been, who have been so eager to class all malignant or putrid fevers under that name, merely because they were generally fatal, and buboes were sometimes, though rarely, and accidentally, observed to make their appearance in them.

I feel it unnecessary to pursue this subject farther, than just to remark, that all the other symptoms which have been enumerated as frequent in *Plague,* will be found in the different cases of this disease ; and if it were fair to infer any thing from its fatality, in this feature, it might justly claim pre-eminence, of most of those epidemics of which we have a history.

I was told by the Thakoor's brother at Moolee, that some of the women mentioned above, were suddenly taken ill in the midst of their usual avocations; that, while conversing, in the middle of a sentence, they would fall down, blood come from their mouth, (not in any great quantity,) and death immediately follow. After allowing a sufficient portion of this account for exaggeration, enough will still remain to show, how suddenly fatal sometimes, its attacks have been.

The symptoms, in general, were such as denoted rather, nervous debility, as convulsive tremors of the muscles, inability to walk, or stand after the first day, delirium, or wandering of the mind, and a very weak pulse; than those which have been supposed to indicate a putrescent state of the fluids. The stomach and bowels were not remarkably deranged, there was no fætor of the breath, or excretions, no sordes upon the teeth, and the tongue was only coated with a white fur; hemorrhage was the only symptoms which could be supposed to arise from a putrescent state of the fluids. In women with child, abortion followed attacks of this disease, and a dead child was produced.

I shall avoid the subject of cure, having no fact that could at all illustrate it. At Moolee, I gave a little medicine to two patients, who died, as all the others had done before them; notwithstanding which, it evidently prejudiced the mind of the people against me, (I believe they thought me, invested with little less than divine power on my first arrival,) and it operated so much in my disfavor at Sila, whither the news had travelled before me, that when I first arrived they obstinately refused to let me see any of the sick.

Rajcote, 21st March, 1820.

A

REPORT ON A DISEASE

WHICH

PREVAILED IN PARTS OF KUTCH AND KATTYWAR IN THE YEARS 1815 AND 1816,

ADDRESSED TO THE

SECRETARY OF THE MEDICAL BOARD.

BY

J. McADAM, ESQ.

Presented 26th December 1836.

The origin of the disease which has for some time raged in Wagur, and the Mucha Kanta, is involved in obscurity. It appears to have been first noticed at Kuntakote, or its neighbourhood, in May 1815. Thence it spread to Munsurra, Chitore, Adooee, and Wandia, all towns in Wagur; and in all of which it committed great ravages during the months of January, February, and March, of the present year. In May last, after it had ceased to prevail in Wagur, it made its appearance in the town of Moorvee, on the Kattywar side of the Run; and there it has continued up to the present time to prevail with fatal effects. In August, the disease repassed the Run to Buchau twenty-three miles distant from this place, and lately appeared, for a short time, at the village of Chiroee, ten miles nearer. It also rages at

present in the large town of Rhadanpore, and has extended its ravages to the province of Sind, where it is said to be the cause, at this moment, of great mortality.

One case of the disease occurred in this town : the person affected came from Buchau, and died the day after his arrival ; but the precaution being immediately taken of having all those who had had any communication with him, sent out of the fort, and his house fumigated and untiled so as to expose it to the sun, it did not again make its appearance. Another instance occurred of an infected person dying outside the fort, all communication with the places where the disease prevailed having been prohibited.

Such are the various places in which this disease has raged, or where it still continues to exist ; and until accounts are received to disprove the opinion, however curious the fact, it must be considered to have originated in Wagur. No affection of a similar kind can be traced, to have previously existed in any country bounding that province ; on the contrary, it appears to have spread from Wagur, as from a centre, and from Kuntakote, as the centre of Wagur.

No case of this disease has come under my own observation. It appears, from the description of the natives, to be ushered in by slight fever, attended with great languor, prostration of strength, loss of appetite, and a certain listlessness or indifference as to the result, which is perhaps as much owing to the apathy of the native character under such circumstances, as to any peculiar effect of the disease—swellings of the inguinal and axillary glands, or of both, soon make their appearrance, but at no particular period, and as these come ra-

pidly forward to suppuration, or the contrary, so is the chance of recovery, greater or less. Death takes place at all periods, but generally from the third to the ninth day.

This disease attacks people of every age, and even infants. It appears principally to prevail among, nay to be almost exclusively confined, to the more indolent classes of society, and particularly those who live on vegetable food: hence the Hindoos, and especially those of the Brahman and Banyan castes, have suffered severely.

In the town of Moorvee, where there are nearly four hundred Rajpoots, of that caste which eats animal food, and who are in the habit of drinking spirituous liquors, and indulging in the use of opium, not one has been affected, though the disease has been raging in every direction around them; and a similar observation, I have heard, has been made in other places.

Another remark which the natives make, and which I think is likely to be just, as they are not apt, to take notice of any thing which is not extremely obvious, is, *that those engaged in the expression of oil, are not liable to infection.*

Such is the information I have been able to obtain from the natives, as to the principal symptoms, and character of this disease. Mr. Robeson, who accompanied Colonel Barkly's Brigade into Wagur, and who went to one of the infected towns, and reported on the nature of the disease to the Political Agent with the Force, confirms the description I have given; and further adds, that the disease was accompanied with a weak, and irregular pulse, often with low delirium, and that the

bowels were in general constipated. In many cases hemorrhage from the lungs took place, which was almost always a precursor of death.

Mr. Robeson, from what he saw of the disease, did not consider it as contagious, but as depending on a certain state of the atmosphere; the people of the town appeared to be of the same opinion, and did not think, they ran any risk of infection by their intercourse with the sick.

With regard to the mortality occasioned by this disease, it has from every account been very great, wherever it has prevailed. Very few of those affected appear to have recovered, and the proportion of deaths, compared to the number affected, has been perhaps as great, if not greater, than in any epidemic or contagious disorder that ever appeared in any country.

I would only be deceiving the Medical Board, were I to attempt to form an estimate of the number of casualties it has altogether occasioned, or to endeavour to fix the proportion of deaths, either to the number of inhabitants, or to the number of those affected with the disease, in the various places in which it has prevailed. Natives, who never feel any interest beyond themselves, or at least their families, are not likely to be very particular in their observations, on what is going on around them, and the inconsistency, and variety of their accounts would preclude, even all approach to accuracy. This was particularly exemplified, when our Force was stationed within twelve miles of Adooee, in Wagur. The natives from the town reported in Camp, that twenty, and twenty-five people were dying daily; whereas when Mr. Robeson went there in person, after the most particular

inquiries, he found the daily casualties did not amount to one-fifth the number, said to take place. From all he could learn, however, hardly any of those affected recovered.

At present the disease, from all accounts, has abated both in Buchau, and Moorvee, the only two places in which it now exists, either in Kattywar or Wagur ; but this is perhaps as much owing to the great mortality it has occasioned, having left fewer subjects for its operation, as to any diminution of its virulence. It appears to be at present spreading entirely northward, having made its way, as I have before mentioned, to the city of Rhadanpore, and the province of Sind ; while I have heard of no place to the south of Moorvee where it has yet appeared.

Though we have no certain information with regard to the origin of this disease, yet if we take into consideration its symptoms, and character, as I have described them from the accounts of the natives, and which have been confirmed by a most intelligent medical gentleman, who had an opportunity of examining many of those affected ; and, at the same time, if we reflect on the dreadful mortality it occasions; we will be led to consider it as the same disease which, under the name of the *Plague,* almost annually prevails in some other countries of Asia, and in Africa.

It exactly resembles that disease in its symptoms, and also appears to me, from every account, to be propagated by contagion. How it may be conveyed from one place to another, has been completely exemplified in the case which occurred in this town, where, if proper precautions had not been taken, I have no doubt it

would have rapidly spread among the inhabitants. No disease either, of a similar kind has ever been known, or heard of in this country, and this is also, I think, no small confirmation of this opinion.

Having taken all these circumstances into consideration, I early communicated my opinion of the nature of the disease, to the Resident in Cutch, who immediately adopted such precautions as were necessary to prevent its introduction into this town, and which, I have no doubt, will answer the purpose intended. As this is also an intermediate stage between the affected places, and the large sea-port towns of Moondra, and Mandavee, (which have an extensive commercial intercourse with almost every place on this side of India,) our success in preventing the admission of the contagion into this place, will, in all probability, be the means of saving them from infection; where, if the disease were once to gain a footing, it would be impossible to say, to what extent it might be propagated.

The disease, as yet, has made its way to none of the sea-port towns in Cutch, nor, if it continues to abate in Wagur, is it likely to do so, as they are so far removed from the seat of its operations. Whether or not it has reached any of the bunders on the Indus, there are no certain accounts.

Since writing the above letter, information has been received that this contagious disorder is now raging with great mortality in Hydrabad, the capital of Sinde. A letter from that place mentions, that the daily number of casualties amount to sixty or seventy. I have also just heard, that the Right Honorable the Governor in Council has adopted precautionary measures, to pre-

vent the introduction of this disorder into Bombay. As the sea-port towns in Cutch are likely to escape infection, it is to be hoped the disease will not be propagated farther to the southward.

I am unacquainted as to what intercourse exists between Bombay and the bunders on the Indus, but, if the disease is as general in Sinde as it is stated to be, more danger is to be apprehended from that quarter, as it is so long before information can be obtained, as to the particular places in which the disorder prevails.

Anjar, November 6th, 1816.

A

REPORT ON A DISEASE

WHICH

PREVAILED IN PARTS OF THE ZILLAH OF AHMEDABAD IN THE YEARS 1817, 1818, AND 1819,

ADDRESSED TO THE

SECRETARY OF THE MEDICAL BOARD.

BY

J. GILDER, ESQ.

Presented 12th November, 1836.

Previous, however, to entering into a detail of the history, and nature of the disease which has for such a length of time, been raging to the westward, it may not be amiss, to set out with a short description of the soil, climate, and inhabitants, of that division of the peninsula of Guzerat, commonly known by the name of Jalawar, the more immediate scene of its ravages.

Jalawar, the most northern district of the peninsula, derives its appellation from the tribe of Jalla Rajpoots, who in former times formed the chief portion of its inhabitants. It is bounded to the East, and South by Goelwar part of Kattywar proper, and the Run; to the North and West by Kattywar proper, part of Hallar, that part of the Run termed Null-khanta, and the Company's

district of Veerungaum comprised within the collectorate of Ahmedabad.

The principal towns are Limree, Wudwan, Drangadra, Hulwud, and Dundooka : the three former have a Thakore of their own. Of these, however, the Thakoreship of Limree is far the most extensive, and has suffered most from the destructive ravages of the disease.

The face of the country presents in general a flat, level surface, denuded of vegetation, except in the more immediate neighbourhood of towns, and villages. The soil for the greater part, consists of a rich black loamy mould, here and there intersected with portions of salt marshy tracts branching off from the Run. In the vicinity of Drangadra, and Wudwun, it assumes a more gravelly appearance, and the chief products are wheat, gram, and cotton. The principal river is the Bhadur, a small stream, which takes its rise in a hill called Mandwa in Kattywar, whence, flowing in an easterly dirrection by Palliad, and Ranpour, it loses itself in the Run near Dollera.

The climate differs but little from that of Guzerat in general. The constant exhalation, however, of noxious effluvia throughout the year, from the extensive tracts of salt marsh, (which covered with profuse, and rank vegetation within the limits of the tides, surround the head of the Gulf of Cambay, and project for many miles inland,) must doubtless exert a pernicious influence on the atmosphere in its vicinity, and may probably confer on it the property of retaining, within certain limits, the proximate causes of a disease, whether contagious or the reverse, when once introduced. This may possibly be thought, too hypothetical an inference,

but little doubt can exist, that such exhalations tend materially to corrupt the air, thereby rendering those who inhale it, more immediately predisposed to feel the influence of a disease lurking in their neighbourhood.

The principal inhabitants of this part of the country are Grassias of the Rajpoot tribe of Jallas ; Banyans of the Shravoe, or Jain sect, Koombies, Katties, and a few Bhoras.

As it is at all times a matter of difficulty, to obtain from native authority, information whereon reliance can be placed, and as they invariably either exaggerate, or distort the subject of their communications, whenever such refer to circumstances beyond their limited comprehension—such as in the case of any prevailing disorders, &c.—to the following remarks, therefore, on the origin, symptoms, and progress, of the disease now raging to the westward, the Board's indulgence is solicited, no case having lately fallen under my personal inspection.

Origin and Progress. In tracing the origin of the disease in question, the natives agree in referring the period of its first introduction, to the Hindoo year, or Sumwut, 1873, A. D. 1817, three years subsequent to the dreadful famine, which raged with such destructive fury, over Guzerat and Kattywar. The disease first broke out at Dollera, where it is said to have been introduced from Moorvee, a town in Kattywar proper, but different opinions are entertained as to the precise mode of introduction; some alledging it, to have been conveyed by merchants, and petty traders from Kutch, others referring it to those people who annually come from Kutch, in the cotton season (February to May) with their

wheels for separating cotton from its seed. There is coincidence however, in the material point, of its having been imported from the westward.

It is worthy of remark, that although the disease was in the town of Dollera, three people only were attacked, all of whom died. From Dhollera it spread over the neighbouring villages of Buriad, Rajka, Peeplee, &c. and reached Dundooka. It continued in this neighbourhood till the close of 1817, diffusing its baneful influence, amongst the villages situated on the Run, when it gradually decreased, but did not disappear altogether; for several insulated cases were constantly occurring, in the numerous villages of the Dundooka, and Limree districts.

It continued lurking in this manner till the beginning of last year, when it broke out in the month of April with renovated fury, at the village of Buriad situated three miles to the westward of Dhollera. It raged in that village till the setting in of the monsoon, and during the period of two months, forty families were entirely destroyed. In the beginning of June, it spread to Rajka, a village three coss to the west of Buriad, and nearly depopulated it: during the rains it diffused itself over a large tract of the country, carrying consternation, and certain destruction wherever it went: it manifested equal virulence at several places (though remote from each other) much about the same time.

It was towards the end of June that it first appeared at Limree; where the fatal effects and dreadful ravages were so awful, that the poor, terrified inhabitants, after losing from 1500 to 2000 of their number, deserted the place entirely for a time, leaving a few to perform

the last melancholy rites of burning, or burial, to such of their relatives, and friends, as were lingering under the disease.

Subsequent to the dispersion of the inhabitants of Limree, the disease abated in violence there, only to break out with increased vigor, in several other towns, and villages both to the east and west of it; some of which it entirely depopulated.

It should be remembered that, while this work of destruction was going on, the rains were pouring down in torrents; the whole surface of the country between each village (which is generally situated on a rising ground or artificial hillock,) presented to the view, but one sheet of water. The communication thus impeded betwixt different parts of the country, confined the inhabitants, within the precincts of their respective habitations, and compelled them, as it were, to inhale an atmosphere already overladen with morbid effluvia; additional strength was thus given to the disease, and its victims were, as it may readily be supposed, proportionably numerous.

* The utmost eastern limit of its progress hitherto, has been the village of Bullole in the Limree districts, on the western bank of the Run, and about twenty-five coss west of that city; it has not hitherto made its appearance to the eastward of this salt marshy belt.

* Mr. Orton, in proceeding from Kaira to Bhooj in October 1820, had information of the prevalence of this disease at Radanpoor, Summer, and other towns and villages, about the latitude of 23° 40′ at different periods, while it was prevailing in Guzerat.

(Signed) JOHN SCOTT,
Secy. Med. Board.

10th Oct. 1836.

The destructive course of this dreadful scourge, seems to confine itself principally, to such of the native population as subsist entirely on vegetable diet—namely, Brahmins, Banyans, Soonars, Durzees, and Khoombhees—those using animal food, with few exceptions, generally escaping.

What is singular, and may tend to corroborate an idea of its being, under certain circumstances, contagious, is the fact, that when it once obtains a footing in a particular tribe or profession—such as Banians, Soonars, Tailors, &c., it seldom abates without having gone through, every individual of such tribe resident at the same place, and in general, making victims of them all.

Symptoms and Effects. From the native descriptions of the symptoms of this malady, one might be led to infer the existence of two distinct diseases: this supposition might at first seem corroborated by their having separate names for each.

The one they term *Ghant ka rog*, or the knotty disease; the other they distinguish by the appellations of *Kokla ka rog* and *Tao ka rog*, signifying the expectorating disease and the fever disease: these, though equally severe in their characteristic symptoms, and similarly fatal in their effects may only be aggravated varieties of the same disorder, acted upon by a vitiated atmosphere, and other local causes, which could only be successfully developed by personal investigation.

They describe the *Ghant ka rog* to possess the following symptoms: great, and general uneasiness of the frame, pains in the head, lumbar region, and joints, on the day of the attack; hard knotty, and highly painful

swellings of the inguinal or axillary glands (whence the name) appear; in some instances, the parotids are affected, and in four or five hours fever supervenes. These symptoms go on increasing in violence, attended with great thirst, and delirium, until the third day of the attack, when death closes the scene; but should the patient survive the third day, hopes of recovery begin to be entertained. Suppuration of the glandular swellings occurs on the fourth or fifth day, and the other symptoms gradually diminish in force; the fever assuming a milder aspect, and the patient regaining his strength in twelve or fifteen days. Such favorable terminations are, however, rare.

This form of the disease was introduced into the village of Bullole in the end of December last, by a Banian of the place, who had returned from Dewpoora, whither he had been on business, and where it was raging at the time. The night after his return he complained of great uneasiness, pains in his loins and joints, attended with fever: these symptoms continued increasing throughout the night, and the next morning he perceived swellings of his inguinal glands, which were exceeding painful: during the day he became delirious, and complained of intense thirst: no abatement occurred on the third day, on the evening of which he died.

Every person belonging to this man's family, both male and female, died, within the space of ten days, of the same disease, which spread to the other two Banian families in the village, and committed similar ravages. After remaining about fifteen days from its first introduction, during which period it destroyed about thirty

of the inhabitants, out of a population of nearly two hundred, it disappeared.

The following case occurred in May 1817 at Dollera, while I was there on business. The symptoms and treatment are stated from the best of my recollection, and, though the disease terminated fatally, I am inclined to think that bleeding and the use of brisk cathartics in the early stage, would go a great way, in arresting the progress of this destructive malady.

In a lad, fourteen years of age, the disease was ushered in with considerable pains in the head and loins, sickness at the stomach, and vomiting of bilious matter, turgidness of the eye, full, strong, and hard pulse, skin dry, and intensely hot; I immediately gave him a strong cathartic of jalap and calomel, and took away twelve ounces of blood: the symptoms subsided in two or three hours after the operation of the medicine, but returned with increased violence the following morning, when I repeated the medicine and bleeding; this partially relieved him: an exacerbation of all the symptoms took place in the evening, with an enlargement of the glands in both armpits, which continued to increase throughout the night, but, without assuming any circumscribed appearance as in common bubo; he died at sun-rise the third morning from the attack.

This boy was living in a small hut, surrounded by his relations, who, of course, performed all the requisite duties his situation required, but not one of them was affected by the diseased.

Of five other cases, the first symptoms yielded to brisk cathartics. In the same compound where these cases occurred, there were upwards of two hundred

people, including children, all of whom came from the same district.

The other form of the disease, known to the natives by the names of *Kokla and Tao ka rog*, and which at present prevails most, is described as exhibiting the undermentioned symptoms: high fever, attended with burning and excruciating pains about the *Scrobiculus Cordis*, skin intensely hot, with a feeling as if the body within was on fire; hic-cough, with deep and oppressive breathing ensue: there is a pricking sensation all over the body, as if it were perforated with pins; considerable pains in the chest and joints, and about the navel; delirium, great anxiety and thirst follow: at length, the patient hawks up clots of blood, the difficulty of breathing increases, and death generally occurs on the second day of the attack.

In both cases, native practitioners administer stimulants for the first, and astringents for the ultimate stages of the disease; but, being averse to the use of purgatives, (which experience teaches us, are the principal, and only effectual remedies prescribable, in the fevers of India,) their labours are unattended with success.

I shall not presume upon the Board's patience further, by attempting to investigate the laws by which this malady is controlled, or account for the causes that produce it. I shall merely state that the name of the *Plague* has, in my humble opinion, been erroneously given to it. From the limited experience I possess of its nature, I am inclined to think it an aggravated description of typhus fever, rendered more

terrible in its effects from local causes, and a peculiar morbid state of the atmosphere, which would probably yield to the usual antiphlogistic regimen of European practice ; but, in the absence of more correct information, it would be useless enlarging upon these intricate points, without the aid of practical experience and personal observation on the spot.

Ahmedabad,
25th February, 1820.

A

FEW REMARKS

ON

THE DISEASES IN THE HOSPITAL

OF

THE 3D TROOP OF THE HORSE ARTILLERY AT DEESA,

DURING THE

MONTHS OF AUGUST, SEPTEMBER, OCTOBER, NOVEMBER, AND DECEMBER, 1834.

BY

R. BROWN, M. D.

Presented April, 1836.

Before entering on our immediate subject, it may be well to premise that the Deesa Cantonment stands on the left bank of the Bunass river, the bed of which is about three hundred yards in breadth, and during the rains, generally filled from bank to bank.

In the dry season however, though the stream is perennial, it is shallow, sluggish, and confined to a narrow channel, leaving the soil of its ill-defined margin, saturated with moisture, and covered with a rank and reedy species of vegetation.

On the cantonment side of the river, there is a slip of plain varying in breadth from half, to three quarters of a mile, possessed of alluvial characters, somewhat under the level of camp, and in consequence of this low position, it is frequently under water, during the rains. Here, there

are several large spots of garden ground cultivated by natives ; whence are chiefly procured, the vegetables (of excellent quality and in considerable abundance) used in camp.

Immediately on the eastern border of this plain, but somewhat elevated, stand the Horse Artillery Barracks airy and spacious in themselves, and fronting towards the south-west. Though I am not aware that any evil has hitherto resulted from their locality, it is nevertheless perhaps to be regretted, that for the sake, as would appear, of convenience in being near the river, barracks for Europeans should have been set down here, instead of on the continuation of the comparatively elevated, clear, and airy ridge judiciously selected for the barracks, and lines of the Bombay European Regiment, in the first instance, and now occupied by His Majesty's 6th Regiment.

The surface of camp is pretty nearly level, having simply inclination enough towards the river, to allow the supernatant water to run off. The soil is dry, of deep sand, and resembling in many respects, that of the adjacent desert.

In ordinary seasons, except by means of irrigation on little spots of garden ground, around officers' houses, there is but little vegetation, and none certainly, in the least degree, rank, or otherwise objectionable. Hence perhaps, in a great measure, that perfect immunity, which as far as my experience goes, this station had hitherto enjoyed from every variety of endemic disease.

Last season however, from the unusually heavy rains, the surface of camp assumed a somewhat different aspect ; being in every uncultivated part, clad with rank, shrubby jungle, consisting chiefly of a variety of wild

Indigo, (*Galega purpurea,*) which, during the earlier stages of putrefactive fermentation, in the end of August and beginning of September, emitted a strongly offensive smell.

Though this jungle, was as quickly as could be, cleared away, and burnt by working parties from the different regiments, and other means, under the direction of our energetic local Commandant; it was nevertheless the source, it is but fair to infer, from the circumstances that followed, of a highly virulent, febrific miasma.

Of the precise nature of this invisible, and noxious agent we remain, I believe, in almost total ignorance; but this much without doubt we do know, that its primary effects on the human body, are to derange the due equable, and steady nervous, and sanguineous distribution, and to be the occasional cause of, or in short to produce, when sufficiently concentrated, the phenomena of fever.

The object of this paper, being simply to give a very brief statement of the appearances, and treatment of the diseases that prevailed, I shall endeavour to confine myself strictly to this. To prevent confusion of ideas however, in the event of it being necessary to advert to the causes of fever; it is proper to mention that I shall adhere to the old custom, and consider the *remote causes* to consist of two kinds, viz. *the occasional or exciting, and the predisposing or accessory;* the former being altogether independent of the patient, the latter connected with, or in some way belonging to him. With respect to the *proximate cause* it need never be used, as it will, if necessary, be better expressed by the terms essential symptoms or pathology.

I shall annex, for the sake of easy reference, an abstract return of the sick in hospital, during the last five months, and for the sake of contrast, a similar return for the corresponding months of 1833, a year which may be taken, I consider, as affording a fair average of sickness here.

The troop consisting of 116 Europeans continued, as usual, healthy up to the beginning of *August* last, but towards the middle of that month, several cases of fever and dysentery presented themselves. By referring to the annexed return, it will appear that during this month, there were admitted 26 cases of fever, and 8 of dysentery ; discharged recovered, of the former 21, and of the latter 7.

On the 1st *September* there remained in hospital 12, of which 9 were of fever, and 1 of dysentery ; admitted during the month 38, of which 21 were fevers, 5 of dysentery, and 1 of cholera ; discharged recovered 36, of which 17 were fevers, 6 from dysentery, and 1 from cholera.

On the 1st *October* there remained 15, of which 13 were fevers; admitted during the month 49, of which 35 were fevers, 1 of dysentery, and 2 of cholera ; discharged recovered 33, of which 22 were from fever, and 1 from dysentery ; died 1 from cholera, and 1 under the head of fevers, but rather from rupture of a blood-vessel, and consequent effusion of blood at the base of the brain, (as revealed by dissection) when at stool in the hospital privy.

The subject of this unfortunate case had no fever for upwards of a fortnight before his death, and on the morning before it took place, he was walking about with the other convalescents, slowly but appar-

ently, rather improving. He did not complain before going into the privy, and fell from the seat without any warning, dead on the ground.

I mention this circumstance, not so much on its own account, but because though it fell to my lot, in addition to the Troop of Artillery, to have medical charge, during the whole of the late epidemic, of the 21st Regt. N. I., and a rather numerous station staff, this has been my only fatal case, either among Europeans or Native troops, under the head of fever, during the period embraced in this report. Let it not be supposed that I mention this in a spirit of exultation, because others here, may have been less fortunate. Far otherwise : I do so simply as a fact, which, in estimating the treatment pursued, it is essentially necessary should be known.

On the 1st *November* there remained 29, of which 25 were of fever, and 1 of cholera ; admitted during the month 67, of which 62 were of fever, 1 of chronic liver, and 1 of cholera; discharged recovered 54, of which 51 were from fever, and 1 from cholera ; died 1 of cholera.

On the 1st *December* there remained 41, of which 36 were with fever, and 1 with chronic liver ; admitted during the month 50, of which 36 were fevers, and 7 of dysentery ; discharged recovered 71, of which 62 were from fevers, and 3 from dysentery; died 1 from dysentery, and 1 of chronic liver.

On this day, 1st *January* 1835, there remain 18, of which 10 are of fever, and 3 dysentery.

Ten men only, as far as I can ascertain, out of the the whole troop, escaped fever, and a large proportion of

this small number were non-commissioned officers, who from their situations, were probably less exposed to the night air, on sentry, and otherwise; and were at the same time, of necessity, more regular in their habits than the men in general; consequently, it is but reasonable to suppose, less likely to be influenced by either, its occasional or accessory causes.

It will without special remark, at once appear, from comparing the number of admissions with the numerical strength of the troop, that many must have relapsed. This was the case in but too many instances, in spite of every care to ascertain, that they were quite well, to all appearance, before being discharged. It was, in some degree, fortunate that the latter attacks, though in some instances frequent, and occasionally obstinate, generally assumed the true *intermittent* character.

With respect to the fever itself, I ought to mention that, that which prevailed from the beginning of *August* till the end of *November,* was of a mixed nature, having many symptoms, common to *remittent* and to *continued fever.* Instead however, of attempting to draw nice (and as I would submit in many cases useless) distinctions as to its genus—for every one who has seen much of fever, must have observed the close affinity, frequently existing among its different genera, and how much these are modified by circumstances, in themselves, not very obvious or important—I shall briefly note a few of the leading symptoms, and give a summary of what appeared to me, the most suitable treatment, in the generality of cases.

A man for instance, apparently in good health, would

complain of a feeling of overpowering fatigue, and extreme exhaustion without any adequate cause: by and by there would come a few rigors, the features would look shrunken, and the eyes dull, heavy, and listless; he would complain of an obtuse, beating pain of head, of a feeling of weight, oppression, and tenderness, over the epigastric, and hypochondriac regions, with much nausea and ineffectual retching; bowels various, tongue generally loaded, white, and moist; pulse small, and generally quick.

In a short time symptoms of re-action would appear: the pulse and skin would increase respectively in volume, and temperature; the head-ache become acute, with occasional delirium; the tongue grow somewhat furred and dry; much thirst; bowels at this stage generally torpid; nausea constant, retching distressing, sometimes followed by vomiting of offensive, dark colored fluid, the ejection of which, when aided by warm water or other provocative, generally gave temporary relief; urine very high colored, clear, and scanty; pains in the back, and loins always present, sometimes very distressing, with incessant changing of posture, and tossing about.

This stage was very uncertain in duration, sometimes partially remitting for a short period, and again returning: at length, after a day or two, or three, (for there was no definite period,) a perspiration would break out, happily sometimes warm and general, bringing relief for a time, of all the symptoms; but sometimes on the contrary—and that not unfrequently —partial, cold, and clammy, without relief of symptoms, with continued irritability of stomach feeble,

quick, compressible pulse ; great depression of spirits ; occasionally involuntary passing of watery stools; urine scanty, dysuria ; tongue various, but generally in the early paroxysms moist.

This condition which in many cases, seemed almost to amount to irretrievable collapse, sometimes continued for a long time, and was always highly alarming ; would be superseded by a fresh re-action less strong than the former, generally, but marked with symptoms, for the most part, of determination to, and congestion in, some important viscus, as the liver, spleen or brain ; and a process similar to that above described, would be again gone through, until the disease was subdued, and the equilibrium was restored.

The above were the symptoms of the fever, that generally appeared, up to the end of *November;* but during the last five weeks, or thereabout, the admissions have, for the most part, been of men who had suffered severely during the previous months, and have been of a distinct, intermittent character, with, in almost every case, a strong tendency to dropsical effusion, to passive hemorrhage from some of the mucous surfaces, and to a morbid condition of the excrementitious secretions from the bowels, and kidneys.

The cases of dysentery during the early months, were for the most part mild, and yielded readily to the ordinary treatment. During the last two months, on the contrary, the admissions under this head have generally been of men, who had suffered from recent, severe attacks of fever, and have, in several instances, unfortunately exhibited those symptoms which pathologists point out, as indicating the existence of the second

stage of that disease, or that, where congestion, or inflammation is supposed, to have nearly ceased, and change of the intestinal structure, to have begun.

Of this disease one man died last month. He (John O'Brien) had, long before coming into hospital, been observed to look ill and emaciated. In spite of every effort, I failed to affect his mouth. On dissection (by my friend Mr. Parsons) the large intestines were found immensely thickened throughout, and dreadfully ulcerated.

There is another case of this disease (C. McDonough's)* which I ought to mention; but, as it is my intention when the result is known, to draw it up somewhat in detail, it is unnecessary to dilate upon it here: suffice it to say, that the subject of it, after having suffered severely from fever, had got sufficiently well to be permitted to return to his duty as a farrier.

A considerable time thereafter, he returned to hospital, and though he had continued to do his work during the interval without complaining; it was obvious, from his appearance and the symptoms described, that the seeds of much intestinal mischief had taken deep root. On the 20th *December*, without any warning, when at stool, a portion of large intestine, about 25 inches in length, passed *per anum*. Though exceedingly reduced in flesh, and strength, the subject of this case is, upon the whole, rather improving. His appetite is mending, but he is restricted to the blandest food, such as bread and milk, and the continuity of the intestinal canal seems quite re-established; but whether by agglutination of the

* Vide Appendix.

old tube or production of a new, it is of course, impossible to say.

Sloughing, and discharge of considerable portions of ileum, and other small intestine, in cases of invagination, are not very rare; but the separation of so great a portion of large gut, is rather so. BAILLIE, DUNCAN, and several other authors, I believe, have recorded similar instances, but still they may be considered as rare.

On this account therefore, as well as on account of its being a beautiful specimen of morbid intestinal structure, I have requested my friend Mr. Bowstead (having but little cunning in such matters myself) to make a wet anatomical preparation of it.

TREATMENT. I shall now conclude with a very few remarks on the treatment pursued; and first with regard to that of the epidemic fever in the months of *August, September, October*, and beginning of *November*, an outline of the general symptoms of which I have before given.

From the symptoms described, it is almost unnecessary to say, that the obvious indications were to subdue the febrile excitement, with as little permanent loss of strength to the patient as possible; to assist the efforts of the constitution without producing any undue permanent excitement during the stage of exhaustion, or collapse; to remove or ward off the irregular determinations to, or congestions in, any particular viscus; and finally, to correct, and strengthen the deranged, and weakened, natural functions.

On the admission of the patient, which in most cases took place, after the premonitory stage had given way to

that of excitement, venesection was immediately employed to the extent generally, according to circumstances, of from 16 to 24 ounces; this we in general found, from the effect produced, to be enough; for experience speedily pointed out, that by this measure, we must not look to cure the disease, but simply to palliate a dangerous symptom.

About two or three hours after the venesection, or rather, when reaction had to some extent, again taken place, an emetic consisting of a scruple of Ipecacuanha, and a grain of emetic tartar, was administered, and aided by plentiful draughts of warm water. This, when followed by full vomiting, generally brought relief for a time, of all the symptoms, allayed irritability of stomach, produced diaphoresis, and generally left the patient disposed to sleep.

When somewhat refreshed, a dose of six or seven grains of calomel, with four or five of antimonial power, was given, and in the course of a few hours, a compound senna draught, or one drachm of compound powder of jalap. If this did not operate satisfactorily, it was repeated, or in its stead six drachms of sulphate of magnesia, with one grain of tartarized antimony. Purgatives however, were always repeated with some caution, for it was remarked, that even ordinary doses not unfrequently produced alarming exhaustion.

So long as the skin remained above the natural temperature, a diaphoretic draught, such as the following, was given every three or four hours—Liquor Acetat: Ammon. half an ounce, Antimonial Wine, half a drachm; and when the stage of remission, or in some cases, more properly that of exhaustion, came on,

camphor mixture two ounces, sulphuric ether half a drachm, quinine two grains, every second hour, together when indicated with a little warm wine and water, or beer. For this latter, the patient at this stage, often expressed a wish, and while it was generally relished, I never saw it do any injury. These, with warm tea, or something similar as drink, and when necessary, hot bottles to the extremities, were in general the measures taken.

When re-action again took place, though this was, in general, less strong in each succeeding attack, a somewhat similar curriculum, to that above described, was gone through, substituting for the venesection which seldom was repeated, a course of local discipline, when such was indicated, by means of cupping, leeching, blisters, or rubefacients. When by these means the fever had been led to a favorable issue, the only remaining indication was, to restore the natural functions to their former healthy condition.

It may have been remarked, that during the disease it was never my object to mercurialize the patient, rather the contrary. Though sometimes the calomel did produce its specific effect slightly, I never gave it with that view, but simply as a deobstruent cathartic. During the convalescence however, when the secretions, or other symptoms, pointed it out; a pill consisting of three grains of blue pill, four or five of compound rhubarb pill, and two grains of quinine, three times a day, till the gums became tender, together with infusion of gentian, or other bitter, with some one of the mineral acids, was frequently highly beneficial. This, or something similar, with light but nourishing diet,

half a bottle of beer, or a * corresponding quantity of wine, generally completed the convalescence.

The fevers during the last month have been all, as has been remarked, of the intermittent character, combined, in many cases, with a tendency to dropsy and hemorrhage. The mode of treatment has been, brisk purging, followed by a few doses of bark, and quinine, with one of the diluted mineral acids: nearly all have yielded readily.

Three or four cachectic cases remain, the result of repeated, or long continued fever, which perhaps only change of air can benefit. The remainder in hospital are all doing well.

Though the immediate effects of the epidemic may be considered to be gone by, and the casualties relatively have not been numerous, it is but too probable, from the appearance of the troop in general, that the baleful consequences of the disease will remain among us for many months.

I have already transgressed in the length of this paper beyond all due bounds, so shall say nothing now on the subject of the thermometrical indications, farther than, that we had ice in the open air this morning, on those places most favourable to radiation.

Deesa,
3d January, 1835.

* By corresponding I do not mean as to quantity, but as to the effects, one or two measures, according to circumstances.

Abstract Return of Sick in Hospital of the 3d Troop Horse Brigade from the 1st Aug. to 31st Dec. 1833 and 1834.

Average Strength of the Troop, 108.	August 1833.						September 1833.						October 1833.						November 1833.						December 1833.					
	Remained.	Admitted.	Total.	Discharged.	Died.	Remaining	Remained.	Admitted.	Total.	Discharged	Died.	Remaining.	Remained.	Admitted.	Total.	Discharged	Died.	Remaining.	Remained.	Admitted.	Total.	Discharged	Died.	Remaining.	Remained.	Admitted.	Total.	Discharged.	Died.	Remaining
Diarrhœa	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dysentery	2	3	5	4	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fevers	1	2	3	2	0	1	1	5	6	2	0	4	4	2	6	5	0	1	1	2	3	3	0	0	0	0	0	0	0	0
Hepatitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pulmonic Affections	0	1	1	1	0	0	0	1	1	0	0	1	1	1	2	1	0	1	1	2	3	2	0	1	1	1	2	2	0	0
Cholera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Diseases	6	18	24	16	0	8	8	5	13	6	0	7	7	5	12	7	0	5	5	4	9	2	0	7	7	8	15	9	0	6
Total	9	26	35	25	0	10	10	11	21	9	0	12	12	8	20	13	0	7	7	8	15	7	0	8	8	9	17	11	0	6

Average Strength of the Troop, 116.	August 1834.						September 1834.						October 1834.						November 1834.						December 1834.					
Diarrhœa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dysentery	0	8	8	7	0	1	1	5	0	6	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	7	7	3	1	3
Fevers	4	26	30	21	0	9	9	21	30	17	0	13	13	35	48	22	1	25	25	62	87	51	0	36	36	36	72	62	0	10
Hepatitis	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	1	0
Pulmonic Affections	0	0	0	0	0	0	0	1	1	0	0	1	1	3	4	1	0	3	3	1	4	0	0	4	4	1	5	4	0	1
Cholera	0	0	0	0	0	0	0	1	1	1	0	0	0	2	2	0	1	1	1	1	2	1	1	0	0	0	0	0	0	0
Other Diseases	4	17	21	19	0	2	2	11	13	12	0	1	1	8	9	9	0	0	0	2	2	2	0	0	0	6	6	2	0	4
Total	8	52	60	48	0	12	12	39	45	36	0	15	15	49	64	33	2	29	29	67	96	54	1	41	41	50	91	71	2	18

Abstract Return of Sick in Hospital of the 3d Troop Horse Brigade from the 1st January to 31st December 1835.

	January.						February.						March.						April.						May.						June.					
	Remained.	Admitted.	Total.	Discharged.	Died.	Remaining.	Remained.	Admitted.	Total.	Discharged.	Died.	Remaining	Remained.	Admitted.	Total.	Discharged.	Died.	Remaining	Remained.	Admitted.	Total.	Discharged	Died.	Remaining.	Remained.	Admitted.	Total.	Discharged.	Died.	Remaining.	Remained.	Admitted.	Total.	Discharged.	Died.	Remaining.
Diarrhœa.....	0	1	1	1	0	0	0	1	1	1	0	0	0	1	1	1	0	0	0	1	1	1	0	0	0	1	1	0	0	1	1	1	2	1	1	0
Dysentery.....	3	9	12	3	1	8	8	1	9	4	1	4	4	1	5	3	0	2	2	0	2	2	0	0	0	2	2	1	1	0	0	2	2	1	0	1
Fevers.....	10	15	25	17	2	6	6	21	27	26	0	1	1	8	9	6	0	3	3	6	9	8	0	1	1	8	9	6	0	3	3	1	4	4	0	0
Hepatitis.....	0	0	0	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pulmonic Affections	0	0	0	0	0	0	0	5	5	2	0	3	3	0	3	3	0	0	0	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0
Cholera.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Diseases	5	5	10	7	0	3	3	9	9	8	0	4	4	12	16	12	0	4	4	10	14	9	0	5	5	17	22	19	0	3	3	3	6	6	0	0
Total....	18	30	48	28	3	17	17	39	56	43	1	12	12	22	34	25	0	9	9	18	27	21	0	6	6	29	35	27	1	7	7	7	14	12	1	1

	July.						August.						September.						October.						November.						December.					
Diarrhœa.....	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dysentery.....	1	4	5	2	0	3	3	6	9	8	0	1	1	1	2	1	0	1	1	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0
Fevers.....	0	20	20	13	0	7	7	32	39	22	0	17	17	25	42	31	0	11	11	19	30	18	0	12	12	26	38	29	2	7	7	11	18	15	0	3
Hepatitis.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pulmonic Affections	0	0	0	0	0	0	0	2	2	2	0	0	0	2	2	1	0	1	1	4	5	4	0	1	1	0	1	1	0	0	0	0	0	0	0	0
Cholera.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Diseases....	0	11	11	9	0	2	2	6	8	8	0	0	0	9	9	7	0	2	2	6	8	8	0	0	0	1	1	1	0	0	0	3	3	2	0	1
Total.....	1	35	36	24	0	12	12	47	59	40	0	19	19	37	56	41	0	15	15	29	44	31	0	13	13	28	41	31	3	7	7	14	21	17	0	4

* *Note by the Secretary.* As Dr. Brown in the latter part of his Report expresses an apprehension, that the effects of the endemic would be subsequently felt in the Troop, it has been considered desirable to annex this return of the sick of the following year. It has been extracted from the records of the Medical Board Office.

EXTRACTS

FROM

THE HALF YEARLY REPORTS,

OF

THE DISEASES PREVAILING AT DHARWAR

IN

THE 1ST GRENADIER REGIMENT, N. I.

FOR THE YEAR 1836.

BY

D. FORBES, ESQ, SURGEON.

Presented August 1836, *and February* 1837.

DRACUNCULUS. During the last four months, Dracunculus has prevailed to a considerable extent in the regimental hospital here, as also, in an unusual degree, in the town of Dharwar, and districts adjoining.

The admissions commencing during the hot weather of April, and May, at which time a great scarcity of water prevailed over the whole district; every tank in the neighbourhood being perfectly dried up, and the greater number of the wells yielding so scanty a supply of water, as rendered it necessary for the natives, to wait by turns at the bottom of some of the wells, until the spring slowly supplied their daily wants.

Since the setting in of the monsoon, which took place on the 21st June, the admissions have gradually

increased, as may be seen by a reference to the following extract from the hospital register book.

I shall also insert the admissions of the former year, contrasted with which, a very great increase of the disease this season, will be evident.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1835.	0	1	0	2	4	4	8	9	9	3	0	2	42
1836.	0	0	1	12	23	53	50	22	19	13	4	9	206

Men, women, and boys have been subject to the disease, but in what proportion I am unable to state: most of those affected have had two worms extracted, many of them four, five, and six; and a man now in hospital, has had fifteen exposed to view, and many of them extracted. One European only, of the regiment, has suffered from the disease.

Since reading Mr. Duncan's valuable paper in the Transactions * of the Medical and Physical Society of Calcutta, I have repeatedly examined the guinea-worm through the medium of a microscope, and the innumerable quantity of animalcules contained therein is truly wonderful.

To procure these animals for microscopic inspection, I have found the following plan succeed very well: lay open the vesicle, and after the escape of the serum, you will generally find a delicate, transparent, membranous tube, which is connected with the extremity of the worm; pour a stream of cold water on this spot, and you will observe the tube becoming gradually

* Vol. vii. part 2d.

dilated, and an innumerable quantity of young, will be ejected from its orifice. I have repeated this operation in a number of cases, and in all of them, with a similar result. In one instance, this fine transparent tube was retracted into the limb, after three ejections of the young; the following day, the tube was found protruded as before, and the same results followed on the application of the water.

When examined immediately after birth, the animalcules are seen floating in a viscid secretion, ejected with them, head coiled up, tail in active motion, which becomes greatly increased, when a drop of water is added during exposure on the inspection glass, or glass-box of the microscope, or by putting them in a phial of water. In one instance, I examined a guinea-worm that had been easily extracted from its superficial bed, and found it to contain myriads of active young; in fact, the whole extent of the animal, with the exception of a transparent half inch, at one of the extremities, appeared to be the matrix of its countless offspring.*

I have often examined the queen of the Termites, through a microscope, when in the act of depositing her ova. She is prolific indeed, but not in the least to be compared to the human dracunculus in productiveness. We can only account for the multiplicity of these animals, by that general law in natural history, that when the chances of destruction to animals are many, it is

* This point may be ascertained by placing a fold of a guinea-worm, recently extracted, and uninjured, in the microscope at the focal distance, and by directing the object to the light of two or three candles placed in a line, or before the light of an argand lamp; looking attentively, while the guinea-worm is drawn gently across the axis of vision.

then, that nature is at work, and abundant in all her operations.

On examination of the animalcules through a microscope, some of them had the appearance of having a double tail, but on more minute inspection this was found to be a deception, caused by the struggles of the animal, when the fluid is nearly evaporated, and the tail adhering to the glass. A transparent line runs throughout the whole extent of the body.

Symptoms. Among Natives, an intolerable itching over the whole body, is a very frequent characteristic of the period when the guinea-worm is to make its appearance; and this may happen before the occurrence of either swelling, or vesicle.

Soil. The ground to the westward, and northward of Dharwar, is a red ferruginous soil, and to the eastward, an extensive plain of dark deep loam. The water in all the tanks is of a red, ochry appearance, and of a similar colour, in many of the wells.

The treatment I have lately adopted is, laying open the vesicle, pouring cold water on the exposed surface; this disposes the guinea-worm to eject its animalcules, which it will do daily for some time; and when it has ceased to produce, the extremity of the animal is to be laid hold of, and friction to be used over the site of the disease, with gradual extraction, twice a day, at least; cold water poured from a height, on the affected limb, should be had recourse to.

If the extracted portion of the worm is dry, and contracted, it may be cut off, to admit of as many of the young as may remain, making their escape, but care must be taken that the cut extremity is not drawn in;

for I feel convinced, that it is chiefly owing to the irritation of these animalcules, that extensive inflammation, and suppuration supervene, on the breaking of a worm.

The common flour poultice applied over the seat of the disease, soothes and alleviates the pain, but it tends very much, to soften the texture of the worm, and thereby adds to the chances of its being broken during extraction. The native application of the leaves of the *Datura*, or the *Mudar*, is not liable to this objection; I have lately used the bruised leaves of the former, extensively, as a cataplasm, and with decided benefit; leeches and fomentations being had recourse to, only when inflammation is excited in the vicinity of a joint.

I have now multitudes of these animalcules alive, placed in bottles, of well, and tank water, and in different soils kept moist. I have also a specimen of a white worm, (not the *Gordius*,) frequently found in the tanks here, all of which I shall from time to time submit to inspection through the microscope, and report the results in my next half yearly report.

July, 1836.

Extracts from the Second Half Yearly Report.

DRACUNCULUS. A fine yellowish vessel, or intestine arises near the hooked extremity of the Dracunculus, and can be traced throughout the whole extent of the animal: it has a spiral appearance at its origin, and continues so, until it penetrates the pearly part of the worm; it then assumes a waved appearance throughout the remainder of the animal; this vessel may be seen distinct from the tube occupied by the animalcules.

When the guinea-worm is cut down upon, and extracted uninjured before a vesicle has formed, it shews

signs of vitality, though very feeble indeed, for about twenty hours; after which period, it exhales a faint disagreeable odour, somewhat resembling that arising from a putrified portion of animal matter of a similar texture; notwithstanding which, if a fold of the animal is examined by the microscope, the animalcules may be detected lively, and active, throughout. In one instance, they were found alive five days after the extraction of the guinea-worm, which had been preserved in a layer of cotton smeared over with fresh butter, and kept moist with water.

I have examined the hooked or horny extremity of the guinea-worm, by means of a microscope, but have never been able to detect an orifice, although the spiral vessel may be seen approaching, very nearly to the hook.

In several instances of guinea-worms extracted before the period of escape, and examined immediately after; I have observed about an inch and a half at the tail perfectly transparent, and on examination a few hours afterwards, the animal being kept in a layer of moist cotton, this transparency has disappeared, and the space at the tail, has assumed the white or pearly appearance of the worm; with the addition, of a fine transparent tube protruding from its extremity, distended with numerous animalcules.

The external surface of the guinea-worm, when viewed through a microscope, has the appearance of having minute tranverse rugæ; and, at irregular distances, minute projections of a yellowish colour may be detected.

Among the inferior animals, the guinea-worm infests the horse, and the dog. A tattoo was exhibited at

Dharwar, having a worm protruding from the right hind fetlock ; it was of the usual size, and made its appearance as a boil. I examined it before, and after extraction, and could perceive no difference in any respect, from the human Dracunculus. My friend Dr. Walker, of this establishment, gave me a specimen of a guinea-worm extracted from the neck of a dog, and I have had undoubted reports of a similar occurrence at this station.

No appearance of a hook or orifice can be detected in the guinea-worm-animalcule, by the most powerful microscope I could obtain; I have also compared the guinea-worm-animalcules taken from the limb at the usual period of escape, after the formation of a blister, with those taken from one that had been cut down upon and extracted, probably long before its period of escape had arrived, but could never detect the smallest difference in their size or motion.

As I had abundance of guinea-worm-animalcules daily obtained from the sepoy's limbs, by pouring a stream of cold water over the seat of the disease, and collecting them, by means of a camel hair pencil, immediately after ejection, the following experiments were made on two pups of five or six months old.

A quantity of the water containing guinea-worm-animalcules was poured down each of their throats—the first, after three minutes had elapsed, appeared uneasy, became sick, and vomited a small quantity of the watery contents of the stomach, which were examined, and found to contain the animalcules alive; four hours afterwards the pup was killed, the stomach, and the mucus of the intestines were minutely examined with the microscope, and abundance of animalcules were detect-

ed in the mucus of the stomach, and duodenum, but not one of them shewed the least sign of vitality.

The other pup was killed twenty-four hours after the guinea-worm dose had been administered: the mucus of the duodenum, contained abundance of animalcules, but not one of them exhibited signs of life.

Eight cases of sepoys admitted with guinea-worm, all of them in the form of vesicle on the ancle, were selected; the vesicles were opened on the fourth or fifth day, the loose skin cut away with scissors, and a stream of cold water, poured daily on the spot. I have generally under these circumstances, found the animalcules daily ejected from the tube connected with the animal, for a period of from fifteen to twenty days, after which time, they cease to be ejected, and a watery fluid only, or combined with particles of a whitish flaky appearance, continues to be thrown out for two or three days longer; the guinea-worm then becomes flaccid, and is discharged spontaneously, without much pain or swelling; a plantain leaf being the only application used.

In one of the cases treated in this way (i. e. without seizing the extremity of the worm) considerable pain, and swelling of the limb supervened, and part of the cellular substance sloughed away; by this process a fold of the guinea-worm was exposed, firmly compressed by a band of cellular texture; the portion of guinea-worm hanging from the limb was flaccid and perfectly empty; that portion beyond the strictured part of the fold was distended, and when clipped in two, discharged numerous animalcules.

The animalcules obtained from the guinea-worm, and placed in pure well, or tank water, generally die on the

fourth, fifth, or sixth day after birth; those kept in fine impalpable red clay, partially covered with water, and exposed to the sun, were found alive (in one experiment) fifteen, eighteen, and twenty days afterwards, burrowing into the fine, soft, ochry mud; but from the period of birth, till the time of death, I did not observe that they had gained one particle of increase in their size.

A drop of ardent spirits does not prove immediately destructive to them; the head becomes coiled up, the tail more actively moved, and death takes place, in about one minute after the application. Similar results follow an application of spirits of turpentine, only death does not take place quite so rapidly.

In the months of August and September, I examined several of the tanks in this neighbourhood, and found the mud on their banks, and in their half dry beds, abundantly supplied with animalcules; some of them very much resembling those produced by the guinea-worm, when infesting the human limb. Their vermicular motion in the water is exactly similar, and their general appearance the same; they are active, and equally numerous. The point of a penknife inserted into the mud where they are to be found, will raise abundance for examination. I have found them most numerous in localities, where the water assumes a variegated appearance, with a pellicle floating on its ochry surface; and that portion of fine, soft, impalpable mud just above water, contains most, and the time to find them in greatest abundance, is about the hour of three or four, in the afternoon.

They would appear to live longest, by being partially covered with water, and that of a red ochry appear-

ance, seems to suit their existence best; the same remark holds good, in regard to the animalcules taken from the human Dracunculus. Two kinds of these animalcules may be detected in the soft mud; one kind, seven or eight times the size of the guinea-worm animalcule, the other, exactly resembling it.

The first may belong to the *Annelida*, because when examined through the microscope, their tract may be distinctly traced, in the fine, soft mud. No vessel however, containing red blood, could be detected in either of them. Whether any connection will be found to exist, between the tank animalcule, and those infesting the human limb, is left for further investigation to determine.

I have never been able to procure a specimen of the *Gordius aquaticus*. I frequently questioned the men employed in making bricks of the soft mud, on the banks of the tanks, and those employed in the manufacture of earthen pots, and all declared, that they had never observed an animal, in the mud or water, resembling the guinea-worm, as seen when extracted from the human body.

On a review of the subject of guinea-worm, there are some circumstances connected with its natural history, which would lead to the supposition, that what is termed Dracunculus, may be a case, or Nidus, composed of the condensed cellular substance of the body infested; formed for the protection, and nourishment of these innumerable parasites.

This hypothesis accords, in some degree, with the discoveries lately made, in the dissecting rooms in London, of an Entozoon found in cysts, and infesting the whole muscular system. The locomotion of the guinea-worm

if fully established, and the ejection of the animalcules through the transparent tube, when cold water is applied thereon, militates against this hypothesis.

If any connection can be traced between the tank animalcules, and those infesting the human limb, we may conceive the possibility of the former passing into the circulating system, through the medium of the stomach, or intestinal canal; and perhaps, during an inactive or debilitated state of the digestive powers, finding their way to the cellular texture, and by the irritation produced by their presence, causing adhesive inflammation and morbid alteration of structure.

Dharwar, January, 1837.

HISTORICAL REPORT

OF

H. M. 2D. OR QUEEN'S ROYAL REGIMENT,

FOR THE YEAR 1836.

BY

R. H. HUNTER, ESQ.

Presented June 1837.

The 2d or Queen's Royal Regiment, already two years at Poona, remained at that station, till towards the end of May, when they were rather unexpectedly ordered to the Presidency, to make room for H. M.'s 17th, then landing from New South Wales.

The Right Wing reached Bombay on the 29th May, and the Left, with Head Quarters, on the 2d of June. From that period, the whole were quartered in Fort George, till the 10th of December, when the Left Wing embarked in patimars for Vingorla, on route to Belgaum, to relieve H. M.'s 20th, ordered to England. At Vingorla they disembarked on the 13th, and reached Belgaum on the 24th. The Right Wing, with Head Quarters, did not leave till January.

During the time the regiment remained at Poona, the weather, as usual at that season, continued dry and clear, except for a few days in the middle of February, at the change of the moon; and again for about a week,

in the middle of April. During this last period it was very unsettled, accompanied with dark clouds, thunder, and heavy drops of rain ; sometimes preceded by violent gusts of wind, darkening the air with dust. The westerly breezes set in about the 10th of May.

On the march, the mornings were cloudy, particularly as we approached the Ghauts, the clouds trailing along the hills on each side of us, accompanied with fresh westerly breezes, but no rain. During the day the Camp was rendered most uncomfortable by strong, hot winds, volumes of dust, and a scarcity of good water.

In Bombay the weather began to be unsteady about the 2d or 3d of June, but the rains did not fairly commence till the 22d of that month. From that, however, to the 28th, was very wet (full moon) ; afterwards, to the 7th of July, tolerably dry. Again to 13th very wet, particularly during the night. From that to 21st, tolerably dry and clear. Again very wet till the 30th. From this to 6th of August showery. Then very wet till the 27th, with occasionally a remission only for a day or two. Some rain about the 10th of September, (new moon); and again in the evening, about the 21st. This last, though heavy on Elephanta and the islands opposite, scarcely reached Bombay. In all during the season 87 inches fell, of which were in June 18, in July 25, in August 29, and in September, 5. The rains do not usually terminate before the 5th or 7th of October. The average fall is 79 inches.

At Poona, measles, catarrhal fever, and catarrh, all of which had set in some months previously, continued prevalent till the beginning of February, when they

were put a stop to apparently, by a few days of hot winds.

Of the former the cases were numerous, but very irregular, particularly towards the beginning of February. (Only children were affected.) In some the eruption came out one day, and disappeared the next or following day, without disquamation. Others had every character of the fever, without the eruption. Two cases terminated fatally. One by convulsion ; in two the disquamation was succeeded by an aggravation of fever, and pneumonia. The latter characterized by the crepitating rale, &c.

Besides these, were admitted, in January and February, two or three cases of chronic pains. One of Phthisis, (upper lobe of right lung,) and one of Hyperthophy with dilatation of both ventricles of the heart. The latter, though a first admission, ran a rapid course, and proved fatal by hœmoptysis, and pneumonia, (purulent infiltration throughout the greater portion of right lung). Its rapidity was attributable to its complication with aortic valvular disease. In March a few old cases of bronchitis were admitted, owing perhaps to the frequent, and long brigade drills at that season.

During the stormy weather in April, catarrhal fever again made its appearance; and about the same time were admitted, one case of acute bronchitis with some degree of pneumonia ; one of neuralgia, of malarian origin ; one of cardiac asthma ; and one old case of tubercular phthisis.

The Right Wing continued very healthy during the march, but a number suffered very much from the heat,

the first day. One in particular, a healthy grenadier, lay for some hours, after he was brought into Camp, in an extreme degree of exhaustion, bathed in cold perspiration, not unlike a person with cholera. In the evening he returned to his tent, and continued the march the following morning. One also fell out the first day, with aneurism of the aorta, and ultimately died in Fort George, when several pouches of false aneurism were found embedded in the muscular substance of the base of the ventricles. One small one also formed a thimble like projection into the pulmonary artery, immediately behind one of its valves.

Soon after the arrival of the regiment in Bombay, catarrhal fever, of a well marked remitting type, made its appearance, and continued very prevalent in Fort George during the whole monsoon, particularly in the dry and showery weather. Only as the season advanced the catarrhal symptoms became more and more prominent, till towards the middle of August, when some of them on admission were these—cough, dyspnoea, pain or soreness across the chest, and pyrexia ; and the physical signs, dry bronchial rales, unequal and partially extinct respiration, without deficiency of resonance.

After this, the fever gradually verged into a tertian intermittent, and the catarrhal symptoms abated. It still, however, continued very prevalent till the end of October ; but, during that, and the preceding month, the great majority were re-admissions. Relapses also were frequent at this time. Some, indeed, relapsed so often, that we had ultimately to send them to Colaba, for the benefit of a purer atmosphere. There, they

soon perfectly recovered, one excepted, who returned with dysentery, and ultimately died.

In November and December, the fever again assumed the remitting type; in some instances complicated with gastro-hepatic symptoms. This, the bilious remittent of most authors, was altogether a more dangerous fever, but rare. It cut off rapidly some of the native followers, but none of the Europeans, that I am aware of. Three or four, however, admitted during this period, with febrile, gastric and hepatic symptoms, died ultimately of hepatic abscess.

It is perhaps an interesting fact, that not an instance of hepatic abscess occurred, during the previous two years and a half, while the regiment was in Poona.

Major Hunt, probably, may be considered an exception. He left the first year, and ultimately died at sea. Several of the officers also, in the course of the monsoon, suffered from catarrhal fever, in a remitting form, but only one from the gastro-hepatic. The latter became quite jaundiced, the true characteristic of this fever. It strikes me, however, that the jaundice does not so much occur in the course of the fever, as immediately upon its subsidence. It is because the hepatic secretion is at this time restored, perhaps in excess, but cannot find its way into the duodenum, from depraved duodenal secretions, and other crudities. Two cases of gastro-hepatic fever were also admitted at Belgaum, immediately on the arrival of the Left Wing; but possibly the disease may have been contracted in Bombay.

In June, diarrhœa, and cholera were prevalent; the former particularly in the end of that month: in many instances, nearly approaching to cholera.

Dysentery, too, set in with the rains; and to the end of July was the most fatal of all diseases. By the beginning of August, it had become much milder; and towards the middle of that month, as a primary disease, had all but disappeared. One, about this time, admitted with dysenteric, and pyrexial symptoms, died of hepatic abscess, in connection with disorganization of the colon.

All the phthisical cases began rapidly to decline as the moist weather set in, and all proved fatal in the course of the monsoon. One, in whom the disease was complicated with diarrhœa, though he marched down from Poona, died the first month, in an extreme degree of emaciation. During this period, also, terminated fatally two cases of aortic aneurism, and one of hypertrophy with dilation of the heart, accompanied with aortic, and valvular disease.

Of primary pneumonia in an adult, we have not met an instance in the whole course of the year; and only two of pleurisy. Both these (recruits) contracted the disease in the passage out. One off the Cape, the other off Ceylon; but in neither would it seem to have been suspected, till they came on shore.

Fever. We have already said, there were two fevers in the course of the year, catarrhal, and gastro-hepatic, or rather perhaps, we ought to have said, two *febrile constitutions;* for both we believe to have had malaria for their basis, if such an expression may be allowed.

Why in the one the bronchial and schneiderian membranes should have borne the load, and in the other the stomach and liver, may be difficult to explain.

But with regard to the gastro-hepatic, it would seem, there was something very particular in the tendency to abscess of the liver, in this *constitution.*

We know that a transient exposure to cold, will bring on a coryza, or catarrh; and a long continued, pneumonia—that is, during a long continued exposure to cold, the blood accumulates in the lungs to the degree of congestion; and when re-action is too suddenly induced, pneumonia is the result.

So also, it would seem, long continued residence in a warm, moist atmosphere produces relaxation, and languid venous circulation, and the great portion of that of the liver being venous, that organ becomes congested; and when re-action is too suddenly induced by fever, stimulants, or sudden transition to a cold bracing atmosphere, what we term chronic hepatitis, and abscess of the liver, is the result. This is rendered probable also by the frequency of pneumonia, consequent upon any obstruction to the circulation in the left side of the heart, and of hepatitis upon that of the right; and if this be the case, then the stations in the Deccan, which have the credit of being great *liver ones*, are so only, in a very secondary view. They excite hepatitis in the same way, as sudden heat does gangrene in a frost-bitten part: in other words, the Presidency or Concan is the predisposing, the Deccan the exciting cause.

The above will also explain, what seems to be otherwise inexplicable, how, for instance, the sober and regular suffer more than the intemperate or rambling. Congestion is most likely to occur in the former, and re-action is produced by slighter causes. The others

have the advantage of habit, and excitement is neither so rapid nor violent. Perhaps this is a dangerous doctrine, but our theories ought to be borne out by facts. Intemperance leads to the very resource of heat and moisture. It leads to atrophy of the proper texture of the organ, and tuberculization; probably because it destroys digestion, and thus deprives the liver of its natural stimulus, at the same time that it imparts to it, a morbid one. Witness the mammæ of females after the cessation of the menses.

The grand predisposing causes are perhaps fatigue, late hours, early exhausting "constitutionals," and sedentary habits in a warm, moist climate; the exciting, the too sudden change to a bracing atmosphere, whether by change of locality, or by the rapid transition from the S. W. to N. E. monsoons in Bombay, or stimulants in the ordinarily temperate, and sedentary.

Treatment. With reference to this, a few remarks may suffice. In the catarrhal, decided benefit seemed to be derived from bleeding to the amount of eight or ten ounces: at least, we thought, those who were bled, sooner recovered. It is true, one bled to sixteen or twenty ounces on admission was the only fatal case. He ultimately sunk exhausted; latterly with dry bronchial rales over the greater portion of the left chest; delirium and coma. No organic disease whatever was discovered after death. Another was bled a second time, on account of a pain in the right subscapular region, and the unusual continuance of the fever without remission, and that seemingly with instant benefit. Perspiration immediately broke out, the fever remitted, and in a few days he was convalescent.

Many, however, were not bled at all; for our object in bleeding was not to cure the fever, for we don't know what fever is, but to lighten the circulation—that is, to prevent the inordinate action of the left ventricle, aided by the bronchial obstruction, from engorging that of the right, or to remove such engorgement, merely by lessening the volume of the circulating fluid; for from the loose texture of the bronchial membrane, we had no hope of making any material local impression upon that, without at the same time, injuring the general system.

In the gastro-hepatic, circumstances may, no doubt occur, which demand venesection, but more harm than good seems to us, generally to accrue from it. But where there has been much irritability of stomach, or fulness, or tenderness in epigastrium, we have certainly derived benefit from leeches, and fomentations, and occasionally perhaps, blisters.

In this fever the prostration from the very commencement is extreme, and emaciation proceeds rapidly. The more blood saved therefore, we suspect, the more speedy, and perfect the convalescence.

On admission, in all fevers, we give a purgative of calomel jalap and antimonial powder. The latter, perhaps, might be dispensed with, for it is nearly inert. We have given thirty grains at once, without any very marked effect. A quarter of a grain of the tartrate would, no doubt, answer better. These purgatives in the catarrhal, we follow up with the tartarized solution; and with sulphate of magnesia in the gastro-hepatic, till the bowels have been freely acted upon; but if there has been diarrhœa from the commencement, we

give ten or twenty grains of calomel, with two of opium, and follow it with Epsom salts: after these, calomel and opium, with or without the tartrate of antimony, according to circumstances, and saline draughts, till there is a well marked remission; then quinine. In the catarrhal, during the S. W. monsoon, we found the sooner the quinine was exhibited the better, even without perfect apyrexia; but in the gastro-hepatic, it did not answer so well. When the mouth becomes sore, however, there is an apyrexial period; and if quinine is then administered, convalescence proceeds rapidly, but if not, they are almost certain to relapse as the mercurial action wears off.

When speaking of fever in a former part of this paper, we alluded to the great disposition to hepatic abscess in the gastro-hepatic constitution, and therefore perhaps ought to say something here of the treatment; but as we have already given our views of its pathology, that seems less necessary, more particularly as we have hinted that the chief difficulty lies in the diagnosis, or rather in that of the preparatory state, for when abscess is once formed, it is already incurable.

This predisposition or preparatory state, we have said, is portal congestion, as indicated by its symptoms, fulness of the abdomen, heat or uneasiness about the rectum, tenesmus, diarrhœa, &c.; and the reason why dysentery is so often conjoined is merely, that the colon, the extreme, and most yielding part of this system, is exactly in the same state, ready to be acted upon by the same cause—to wit, any vascular excitement.

In this view the indications are simple—1st, to remove, if possible, any obstructing cause in the heart or

lungs; and, at any rate, perhaps a small bleeding to enable the heart to act more freely. We say small, because a large bleeding, by inducing debility, would inevitably add to the congestion.

2d. To remove portal plethora, by saline cathartics, leeches to the anus, &c.

3d. Gently to rouse the action of the liver by mercury; and, lastly, to keep it so by change of climate.

But, on the contrary, should we bleed largely, throw in mercury, and change to a cold climate at once, the liver would run into abscess, in the same way as a frost-bitten part would into gangrene, on the too rapid application of heat.

Cholera, Diarrhœa and Dysentery. These for practical purposes are, perhaps, best placed together, as it would be difficult correctly to separate them.

Cholera, it will be observed, prevailed as soon as the atmosphere became damp; diarrhœa when the rains set in; and dysentery when the damp was united with chilliness.

In this way, perhaps, cholera might be compared to haemoptysis; diarrhæa to catarrh; and dysentery to bronchitis. Be that as it may, the treatment seems to accord with this view. Cholera is sometimes alleviated by venesection; sometimes not. Pure diarrhœa, never; and dysentery requires all the treatment adapted to inflammation of a mucous membrane. In dysentery, after venesection; in cholera, if required; and in diarrhœa, at once, we have always found immediate benefit from a scruple dose of calomel, and two grains of opium, which we follow with castor oil four or six hours after, or, if at night, the following morning.

In the cholera, we repeat again and again the calomel and opium, till the vomiting and purging cease; then small doses of calomel and opium, or blue pill and rhubarb, till convalescence is established. In diarrhœa we have seldom found it necessary to repeat the calomel and opium more than once, twelve or twenty-four hours after the first dose; then blue pill and rhubarb, as in the former case; or hydrargyrum c: creta and Dover's powder. In dysentery a scruple dose, at least, every twenty-four hours, following it with castor oil, either in one or divided doses, or with sulphate of magnesia, where the oil is rejected; leeches, fomentations, poultices, and ultimately, perhaps, blisters; then, as in the former cases, blue pill and rhubarb, &c.

It is not to be forgotten, however, that diarrhœa frequently precedes dysentery, but not so much in the monsoon as afterwards, when the dysentery is more likely to be complicated with hepatic disease. There is in the monsoon also a chronic tenesmus, with dysenteric motions, indicative of latent hepatic disorder; but it scarcely amounts to what could be called dysentery.

We should now perhaps say someting of pulmonary and cardiac diseases, but as the greater number of these cases are already before the Society, we shall here close for the present.

DEATHS DURING THE YEAR.

Diseases.	No.	Remarks.
Cardiac and Aneurism of Aorta	5	One of Mitral Valve, and one of Aneurism of Aorta. The others both Cardiac and Aortic.
Hepatic Abscess, from 1st August.....	4	Of those under treatment, since have died three, besides one

		officer and one woman, making in all, to 1st April, 9.
Dysentery	4	Two in July, one in October, and one in December, both sequels of fevers.
Pulmonary.....	3	One Phthisis Pulmonalis, one complicated with Abdominal Tubercular disease, and one consequent on Chronic Pleurisy, contracted off the Cape.
Enteritis	1	By Perforation. Caput Coli.
Fever.....	1	Catarrhal, 29th July.
Cholera.....	1	June.
Extensive Abscess, sequel of Fever at Poona	1	January 1834.
Total	20.	

Belgaum, 1837.

CASES

OF

CARDIAC DISEASE AND OF TUBERCULAR PHTHISIS

occurring in

H. M. 2D. OR QUEEN'S ROYAL REGIMENT.

BY

R. H. HUNTER, ESQ.

Presented August 1836.

Ever since I joined the 2d or Queen's Royal Regiment in Colaba in 1831, I have been struck with the frequency of cardiac and aortic disease. At first I thought it might be connected with the same morbid state of the blood which gave rise to purpura, so frequent at that station; but it afterwards prevailed to an equal extent in Poona, where no such cause could be assigned. Neither does it appear to be altogether connected with rheumatism, though certainly most frequently so. In some it has been directly traced from that cause, and in others a previous rheumatic attack has rendered it suspicious: some, however, have denied such altogether.

But whether, or not, rheumatism be the first link in the morbid chain, a more efficient cause for hastening

its progress, I am convinced, is the active duty a soldier undergoes whilst buttoned up in his accoutrements. These, by compressing the neck and chest, obstruct the circulation to such a degree, as to excite the heart to inordinate action, and consequent hypertrophy in the strong and muscular, or to dilatation in the weak and sickly; and in either case, particularly if there is any original disproportion of the organ, according to Lœnnec, a very frequent occurrence.

Again, in the former, the natural resiliency of the aorta being overcome by the inordinate force of the circulation, that vessel yields, dilates, and finally gives way, giving rise to aneurism.

It seems extraordinary that, now the effects of tight lacing on females are so well known, a soldier, intended for the most active and long continued exertion, should be placed in a similar predicament, when that very exertion is required. Is it possible he could be placed under more unfavourable circumstances?

It is said it makes him look smart, so says the schoolmistress; and no doubt it does to those who have been accustomed to associate perfection with such dresses and forms, but does it to the student of nature? Quite the reverse; to him it can be productive only of pain. It is true the form having in a great measure, acquired its natural set, before the recruit enlists, his chest is not so squeezed into a triangle, nor his waist unto that of a "spaniora;" nevertheless, taking his active duty into account, the compression can scarcely be less detrimental, and more especially in that climate, from the perspiration it at the same time creates.

To argue the perfection of nature, however, and the

presumption of man, is quite in vain. Let us therefore come more immediately to our subject, and, first, we shall detail three cases of cardiac and aortic disease, and afterwards remark upon their chief points of interest.

1st. G. Lavender, æt 35, stout habit, 10 years in India, admitted 2d February 1836, states that he was three months in hospital in England, with pains in his limbs, and swelling of his joints, but enjoyed good health in India, till two months ago, when he began to suffer from dyspnœa on exertion, or when bound up in his accoutrements; and that latterly it has so much increased, as to prevent him doing his duty as a soldier.

February 5th, noon. Complains of dyspnœa, aggravated on the least exertion and cough, with scanty pituitous expectoration (these latter only since admission); aspect pale or dusky. Apyrexia. Pulse 80; firm and strong, but not of very large volume. Decubitus on back or left side. Sleeps tolerably in general, but indifferently last night, he says, from a pain in left chest. Was bled on admission, and again this morning, to twelve ounces, with considerable relief.

Physical signs. Condition good. Chest large and well formed, but rather fuller in cardiac region, than opposite side. Heart betwixt 5th and 6th and 6th and 7th left cartilages; and arteries over sternum, and up to temples, visibly pulsating. Deficient resonance over 4th, but particularly 5th, 6th, and 7th left cartilages to line of nipple superiorly, and beyond it inferiorly. Deficient also over lower third of sternum, but not very marked towards the middle of that bone. Diastole (2d sound) of heart masked by prolonged sawing murmur over all the sternum, but particularly about its centre; also over left cardiac region, particularly at sternal junction of 4th cartilage; indistinct near costal junction of 5th and 6th; audible under inferior extremity of sternum; in both subclavian, and left subscapular regions. Small bellows murmur over sternum, and sternal extremities of both clavicles, but without tremor or marked pulsation. Systole of heart obscure, but I think short, though it cannot well be compared with the diastole, owing to the sawing murmur. Impulse strong, jogging and heaving over left cardiac region, to very edge of sternum, and even under that bone.

Diagnosis. Hypertrophy at least of both ventricles; and most probably with some degree of dilatation. No valvular disease; no aortic.

Prognosis. As the case may be. Life may be prolonged with great care; but he will be liable to both pulmonary and cerebral apoplexy, but of the former there is most danger.

He rallied a little after this, and was in the convalescent ward a few days; but soon after, his feet and ancles became œdematous, and ultimately his legs and thighs. Dyspnœa gradually increased till about the 7th of March, when he was seized with an aggravation of cough, and copious expectoration of blood, which, more or less, afterwards continued. The agony and dyspnœa became extreme, obliging him to be supported uprightin bed, with his head hanging forward, and his arms, in general, folded loosely round under his knees. He died at five A. M. of the 15th March.

From the utter hopelessness of the case, and the agony he suffered, no stethoscopic observations were made after the hæmoptysis.

Autopsy. No appreciable emaciation. Skin of a dusky yellow hue. Legs and thighs œdematous. Abdomen contained some pints of high coloured serum. Liver indurated and granular. Right lung in all the three stages of inflammation, the greater part of lower lobes of right, in that of the third, or purulent infiltration. Centre of lower lobe of left also apparently in the first stage, or that of congestion.

Heart in pericardium seemed of enormous size. The latter contained six or eight ounces of serum. The organ removed from its investure was unnaturally spherical or obtuse at apex. Deprived of its contents, the auricles collapsed, and the *right ventricle partially so*, it measured fully one half more than the closed fist of the subject, (the fist itself was of enormous size.) The right ventricle was in some measure folded round the left. The septum, convex, projecting into the right ventricle, and on it lay stretched one of the tricuspid valves.

Parietes of right ventricle nearly of equal thickness throughout, or perhaps rather thicker towards pulmonary orifice, ($\frac{1}{4}$ of an inch or more,) and its substance very firm and red. Left ventricle at centre $\frac{3}{4}$ of an inch, $\frac{1}{2}$ an inch at aortic orifice, and $\frac{3}{8}$, or more, at apex. Mitral valves slightly cartilaginous, or gritty at free borders. *Aortic* much more so, and one of them corrugated and knotty, having a perforation in centre, that would admit a pea. Aorta, except at very base, smooth and healthy.

2d. "Private Thomas Devitt, 2d or Queen's Royal Regiment, æt 31.

Phlegmatic habit, and stout frame, 10 years in India: admitted 6th June 1835, with pain in left chest, right shoulder, and arm; dyspnœa, cough, and inability of lying on right side, pulse 96: had not been in hospital for seven years.

June 15th. Feels quite well, he says, and denies all his former symptoms. Apyrexia. Pulse 76, strong, and vibrating at left wrist; comparatively weak, and compressible at right.

Physical Signs. Thorax rather thin, and flat; heart betwixt 5th and 6th cartilages; and carotids up to angles of jaw strongly, and visibly pulsating; deficient resonance over 4th, but particularly 5th, 6th, and 7th

left cartilages, and lower half of sternum. Permanent double sawing sound over right subclavian region, and upper portion of sternum, extending into left subclavian, becoming single outwardly, synchronous with pulse. Harsh, abrupt, single bellows, synchronous with pulse, over sternum, and sternal extremities of clavicles, particularly the right, with pulsation and slight tremor; single, prolonged, and rasping over cardiac region, synchronous with diastole, loudest about the middle of sternum. Systole of heart short, and abrupt; diastole masked by the morbid murmur; impulse at present not very marked.

June 24th. Discharged at his own urgent request.

January 16th, 1836. Readmitted, with catarrhal symptoms.

February 18th. Readmitted, with catarrhal symptoms.

April 5th. Symptoms: dyspnœa aggravated on exertion; sleep disturbed by dreams, and startings, pulse 90, firm, and vibrating; apyrexia.

Physical Signs.—Deficient resonance over 4th, but particularly 5th, 6th, and 7th left cartilages; and lower half of sternum; the former inferiorly to beyond line of nipple. Heart betwixt 5th and 6th left cartilages, and arteries up to angles of jaw strongly and visibly pulsating; systole of heart dull, and not very audible, in either subclavian regions, but more so in right than left, diastole masked by a sharp rasping, loudest at sternal junctions of 3d and 4th left cartilages, and over centre of sternum; where it is superficial, and very sharp. Brief large bellows murmur over sternum, and sternal extremities of clavicles, particularly the right, with considerable pulsation, and slight tremor. Impulse in left cardiac region strong, and hard; less marked, if appreciably increased, under sternum. Purring tremor very distinct between sternal junctions of 3d and 4th left cartilages; best felt by placing the hand flat on the sternum, and the fingers on the intercostal spaces, and then it seems to be under the sternum. Respiration high, and distressed, over all the chest.

April 9th. States that, for some days past, he has suffered from constant palpitation, head-ache, and epigastric uneasiness, particularly after meals: also pain in the right shoulder, and disturbed sleep from dreams, and startings, pulse 80, firm, and vibrating; appetite good; bowels confined; apyrexia.

June 17th. Additional *physical signs*: shaking impulse under sternum; systole only audible in left subclavian region, masked in right by hoarse bellows murmur, &c. &c. &c.

June 18th. Again discharged at his own urgent request.

Recommended to be put over the arm chest.

June 26th. Readmitted July 5th; slight œdema about the ankles: pulse 100, full and vibrating; vertigo and dyspnœa on exertion.

July 8th. Œdema considerably increased, skin and eyes quite yellow.

July 9th. Lies in a soporose state, taking no notice unless roused: capillary obstruction gradually increasing, jaundice continues.

July 26th. Cough urgent, accompanied with tenacious rusty expectoration, œdema on left side extends to thigh; jaundice nearly gone; crepitating rale in right mammary, both lateral and subscapular regions, accompanied in right with a peculiar blowing (bronchial) respiration.

August 2d. Drowsiness continues; dyspnœa urgent: sputa rusty, mixed with streaks of blood. Too ill now to be examined with the stethoscope.

Died at 11 A. M. of the 3d August 1836. *Diagnosis marked prior to examination.*

1st. Morbid state of aortic valves. 2d, Hypertrophy with dilatation of left ventricle. 3d, Some dilatation, but no roughness of ascending aorta. 4th, Dilatation, at least, of right ventricle. 5th, Mitral valves. Questionable very.

Inspection. Skin and eyes yellow. A small quantity of serum in abdomen. Liver of an immense size. *Thorax:* Lower edges of both lungs hepatized, and the left adhering to pericardium. Pericardium contained about 8 ounces of yellow serum, and adhered at different points to the heart. Heart nearly three times the size of the fist of the subject, and of an obtuse, or rounded figure, flattened posteriorly; when laid on the table not unlike a large tortoise shell. Left ventricle at thickest part $\frac{7}{8}$ of an inch, at base $\frac{1}{4}$, and apex $\frac{3}{8}$, right $\frac{3}{8}$ at thickest part. *Aortic valves,* at free border, thick cartilaginous, and rounded. Aorta at origin of Innominata for about an inch and half dilated, and its inner membrane thickened, irregular, and cartilaginous, but smooth to the touch. A similar but smaller dilatation at very base of aorta, or origin of valves, with the inner membrane in a similar state, (thick, irregular, cartilaginous,) but without grittiness or osseous deposition. Mitral, tricuspid, and pulmonary valves, all healthy.

3d. T. Moiles—æt. 37, Laborer, 10 years in India—of a phlegmatic temperament, and moderate frame, states that he generally enjoyed excellent health in this country, till eighteen months ago, when he began to suffer from his present symptoms, but never to prevent him doing his duty, till the first day's march from Poona, on the 21st May 1836, when he was obliged to fall out. That he was only three times in hospital previously—twice in Poona with pains in his legs, shoulders, and arms; the first ten, the other six years ago; and once about six months since, with pain in his right side, &c.

Last admitted on the 15th June. Complains of weight and oppression at chest; dyspnœa on exertion, or when buttoned up; occasional dry cough, and a feeling of stuffing or choking in his throat, particularly in the night or morning; points under top of sternum, but uncertain of

its site. Apyrexia. Pulse 92: small, thready, and compressible. Respiration 18. Decubitus on back or right side.

Physical Signs. Condition tolerable. Face thin, wrinkled, and of a dingy colour. Left nipple higher, and cardiac region fuller than corresponding part of right chest. Chest resonant, except over left 4th, 5th, and 6th cartilages, where it is quite fleshy, from sternum to beyond line of nipple. Deficient also over lower thirds of sternum, and not clear by any means in upper. Respiration high in left subclavian region. Tolerable over rest of chest. Bronchophony in both subscapular regions. Vocal resonance only in subclavian. Heart's systole completely masked by permanent, forcible, large sized bellows murmur, loudest about left 4th cartilage near the sternum. Diastole, or rather the termination of it, audible over costal extremities of left cartilages, but imperfectly, as if the first half was obscured by the systolic bellows murmur. Morbid murmur, and diastole audible above and below both clavicles, the first much stronger under the left. Diastole alone in right axillary region; bellows murmur in left; both again in left subscapular and right lateral anteriorly, but bellows murmur just appreciable. (Pulse 92.) Diastole alone, and very indistinct in right subscapular. Impulse of heart at present inappreciable in left cardiac region, weak and struggling in right, with now and then a sharpish tap or bound.

Diagnosis: Cartilaginous state of aortic valves. Some degree of dilatation, with attenuation of left ventricle, perhaps also of right, but parietes proportionally thicker or firmer than left. Right not much any way. Bronchi dilated in lower lobes of lungs.

August 28th. More restless these last three nights. Disturbed by dreams and startings. Impulse extensive without force.

September 3d. Sleep still disturbed. Dyspnœa urgent in the recombent posture. Pulse 90 to 100.

September 10th. Has for some nights past suffered so much from dyspnœa, and a suffocative sensation on any attempt at lying down, that he has been obliged to sit up the greater part of the night.

September 16th. No sleep from a constrictive sensation in cardiac region. Skin cool. Pulse 120; small and compressible; slight œdema of the feet and ancles.

September 18th. Slept a little at intervals in the night; sense of suffocation less. Stomach very irritable. Pulse 120, small and compressible. Œedema extending. Heart struggling, and occasionally bounding under the sternum.

Vesp. Stomach continues irritable. Refuses every thing but wine and water. Face livid. Limbs cold. Pulse 120, thready.

September 19th. Has dozed a little in the night, but only in the erect posture, with the head bent forward. Died suddenly at 10 A. M.

Autopsy. 4 P. M. Pericardium contained a large quantity of bloody serum. Heart itself, when partially emptied, near twice the size of the fist; and its substance pale, soft, and flabby. Ventricular parietes at centre and apex near their usual thickness, particularly the right. Base of the left ventricle 1 ⅛ inches, of right near ½ an inch, having several irregular pouches of false aneurism embedded in their substance. Two of the aortic valves healthy. The third had a small cartilaginous knot, the size of a small pea, projecting from its free border. Immediately behind this valve, there was an abrupt small opening into several small freely communicating pouches of false aneurism, the two largest of which, the size of doves' eggs, were chiefly embedded in the muscular substance of base of left ventricle, and nearly filled with fibrinous coagula. Another small one formed a thimble-like projection into the pulmonary artery. A quarter of an inch above one of the healthy aortic valves, was an abrupt cartilaginous, but smooth, oblong opening, that admitted easily the middle finger, into another pouch of false aneurism, the size of a small lime, which went obliquely backwards to the left, and ultimately communicated with the others in the substance of the heart. The parietes of these aneurisms, both towards the left ventricle and the pericardium, were reduced to mere membranes. Right side of aorta from a quarter of an inch above the 1st aneurism to near origin of arteria innominata, dilated and slightly cartilaginous, but smooth.

REMARKS.

First of the sounds of the Heart. It was the opinion of the great Discoverer of auscultation, that the second sound of the heart was produced by the contraction of the auricles. Dr. Hope, however, by a series of experiments, proved that, to be erroneous, and came to the conclusion, that it was the sound of the blood within the ventricles, suddenly arrested by the ventricular parietes, at the completion of their dilatation. Later experiments still, have brought this view also in question, though no satisfactory one has yet, as far as I know, been brought forward in its stead.

The conclusion come to at the British Association for the advancement of Science, in 1835, was that, what-

ever the cause of that sound, a normal state of the aortic valves was necessary for its perfection.

This of course, does not disprove Hope's opinion relative to the cause of the sound, but it corrects a very material error of his, that the morbid murmur of aortic valvular disease can never be strong when accompanying the diastole. On perusing the above case, as also others in the India Journal of Medical and Physical Science, it will be perceived that this error led us into perpetual blunders. The opinion of the Association, however, only proves, according to Hope's idea, that the murmur of regurgitation may mask the natural diastolic sound.

The same occurs in disease of the mitral valves. Dr. Hope says, the morbid murmur of mitral disease is loudest about the 4th catillage near the sternum. Of course, we do not mean to bring our insignificant personal experience into competition with his, but we may be allowed to remark that, in the only two cases of mitral disease we have met with, the morbid murmur was confined to about the costal junctions of the 5th and 6th. It was a large, abrupt, hoarse sound, like that of an aneurism, only that it was synchronous with the diastole. That betwixt the 3d and 4th cartilages we have generally found audible over all the sternum, and to a greater or lesser distance on either side of it; it is a prolonged sawing or rasping, and has in every instance been associated with aortic valvular disease.

In both of the mitral cases, we had purring tremor between the 5th and 6th left cartilages at their costal junctions; and in one of the aortic, between the sternal extremities of the 3d and 4th. In false aortic aneurism

engrafted upon true, we had once also, the purring tremor betwixt the right 1st and 2d. In mitral disease only have we found weakness and unsteadiness of the pulse.

Dr. Hope attributed the permanent sawing murmur loudest about the middle of sternum, and under the 3d and 4th left cartilages, and synchronous with the systole, to a morbid state of the aortic valves ; but, from our limited experience, we should say it more frequently, at least, depends upon disease of the base of aorta : we may refer to two of the above cases, as also to some in the India Journal of Medical and Physical Science. In the last case particularly, so convinced were we of this, that again and again we explored that region for an impulse independent of that of the heart. In vain, of course : but we think a similar case might be distinguished by the absence of the diastolic morbid murmur.

To recapitulate then, we would say, a loud or forcible permanent, sawing murmur supplanting the natural systolic sound, is indicative of aortic disease; and of valvular, if supplanting the diastolic. That in the latter, it depends upon the aortic valves, if it is prolonged, superficial, and sawing or rasping, loudest under the middle of the sternum, and 3d and 4th left cartilages ; and upon the mitral if deep, hoarse and abrupt under the costal extremities of the 5th and 6th.

Disease of the tricuspid or pulmonary valves, we have never met with. Of course, these murmurs may depend upon other causes than either aortic, or valvular disease; but here we must refer to Hope.

The next point we would draw attention to, is the way these affections prove fatal. It is now admitted

that hypertrophy of the left ventricle of the heart is the most frequent cause of cerebral apoplexy, and that a patescent mitral valve, with hypertrophy of the right ventricle, to which the former invariably leads, is the most frequent of pulmonary. In two of the above cases, it will be observed, a lesser degree of obstruction (a morbid state of the aortic valves) was the cause of anasarca, pneumonia; and in one, also of jaundice. Besides, there are grounds for believing that the cardiac obstruction was the original cause of the morbid hepatic appearances, and I have little doubt, were it closely looked into, obstruction in the right side of the heart, or even in the lungs, would occasionally be found to be the cause of hepatic abscess. There is more in the pathology of these affections, than is yet dreamt of in our philosophy.

Lœnnec has made frequent mention of the pneumonia of the moribund advancing to hepatization, but not, that I am aware of, to purulent infiltration. If the one however, why not the other, if the agony be more prolonged, as in one of the above cases; and if congestion in the lungs from cardiac obstruction may, during the agony of death, lead to purulent infiltration, there is no difficulty in conceiving that a similar process may take place in the liver.

When an abscess is found in that organ, we never think of inquiring when it formed there, whether during the agony of death, or previously. A similar mistake would have occurred with regard to the above pneumonic case, but for the discovery of Lœnnec. Pneumonia of both lungs, the greater portion of the right in the

third stage, would to any one have been a sufficient cause of death. But under the term inflammation do we not confound more than one pathological state? Here, however, we begin to trespass.

TUBERCULAR PHTHISIS.

1st. Mrs. Wilkins, Ætatis 25. Of a spare habit, and delicate frame. The mother of three children; all dead. Has been long in delicate health. States that, ten weeks ago, on her way down from Poona, she had a miscarriage, which she partly attributed to her having bathed in a tank the previous evening; and that ever since she has been very unwell. Went to her father's in Colaba for some time; but getting worse, was brought to regimental hospital on the 16th July, labouring under the following symptoms. Dyspnœa, cough, and copious whitish expectoration, of a muco-purulent appearance, in masses. Pyrexia, accompanied with profuse perspiration.

Physical Signs were: Very marked deficiency of resonance in left chest; and respiration masked by cavernous, mucous and subcrepitous, or crepitous rales; the former chiefly in subclavian region—Puerile respiration in right—Bronchophony in some measure: perhaps owing to the weakness of the voice, by no means evident.

Diagnosis. Tubercles softened, and softening throughout the left lung, but most advanced in upper lobe.

Prognosis—(as given to her husband). Death certainly within six weeks; and very probably within three —Died 25th July 1836.

Autopsy. The whole of the left lung studded with tubercles, softened and softening, but particularly the upper portion of the superior lobe, which was a mere mass of tubercles, having in the very upper portion an irregular cavity, that would contain a walnut, filled with softened tuberculous matter. Posteriorly, both upper and lower left lobes, particularly towards their edges, condensed, firm, and of a pale yellow color; both to the sight and touch very much resembling tuberculated liver. In lower lobe of right lung, there was also a cavity similar to that in upper lobe, of left, but otherwise that lung seemed healthy. No pleuritic adhesions on either side.

2d. W. Gibbons—H. M.'s 17th Regiment—Ætatis 27. Admitted into the depôt hospital in Colaba with pectoral symptoms, on his arrival from N. S. Wales, on the 14th June 1836.

July 9th. Complains of pain in his chest, and dyspnœa, accompanied with deep hoarse, and muco-purulent expectoration. Aspect pale and sickly: skin cool: tongue clean: appetite good: pulse 100, soft. States that, five years ago, he caught a severe cold at sea, from sleeping on a wet bed, and that, though frequently since at his duty, he has never been altogether well; that he was last taken on the sick report ten days before his arrival in Bombay.

Physical Signs. Thorax rather thin. Upper portion of left chest much contracted, particularly longitudinally, and subclavian region, flattened. A line drawn from left clavicle to nipple, measures about an inch less than right. From spine to sternum, though evident to the

eye, not very appreciable by measurement. Left chest much less resonant than right, except immediately under the clavicle, where it seems clearer than elsewhere. Respiration masked over all the left chest by subcrepitous, and thin mucous rales; puerile over the greater portion of right; bronchial under the clavicle, and outwardly accompanied by subcrepitous rale. Subcrepitous rale also very distinct in right scapular, but not in axillary region. Loud bronchophony, and doubtful pectoriloquy, in left subclavian, and axillary regions. Bronchophony also in right subclavian, and both scapular regions. Sounds of heart extensively audible.

Diagnosis. Phthisis pulmonalis; that is, at present remains of old cavities in upper lobe of left lung, and fibro cartilaginous adhesions betwixt it and thoracic parietes. Tubercles softening throughout the whole of left and upper lobe of right lung, superiorly, and posteriorly.

Prognosis. Death within four months. Died 8th August 1836.

Autopsy. Lungs throughout studded with tubercles, particularly the left. A small cavity in its lower lobe. Firm fibro—cartilaginous adhesions in upper portion of left chest, which required the knife to separate.

No. 3.—R. Galloway, Ætatis 30.—10 years in India—a tailor—of a melancholic temperament, and unhealthy, rather emaciated aspect. Admitted 19th February 1836.

February 20th. States that he enjoyed very tolerable health in this country, till the regiment returned to Poona, two years ago, but since that he has been

very subject to coughs and colds during the cold weather. The latter have been permanent since October last, accompanied sometimes with a thick, sometimes with a frothy expectoration, and a considerable falling off in flesh and strength. That yesterday about 4 P. M. after having been employed some time cutting out clothes, he was seized with an unusually severe fit of coughing, followed by hemoptysis, at first in mouthfuls.

Complains now of weight and compression across the upper part of chest, dyspnœa, and cough, accompanied with an expectoration of blood and mucus. Skin rather warm and dry. Tongue white and furred; thirst; appetite bad; bowels slow; pulse 96, soft; respiration 27.

Physical Signs. Thorax narrow. Right chest anteriorly above 3d rib, flattened, and contracted; and less resonant then left. Respiration obscure under right clavicle, and accompanied with a mucous, or subcrepitous rale, after coughing; high and blowing in right mammary, and subscapular. Puerile over the left, except immediately under the clavicle, where it is rather high, and blowing (bronchial). Very loud bronchophony in right subclavian region; voice resonant, also in left subclavian, and right subscapular Heart's sounds clear, and sharp, and audible, even into left subscapular region.

Diagnosis. Hœmoptysis, from upper lobe of right lung, from tubercular obstruction. Tubercles also in lower lobes, and upper lobe of left. Heart attenuated.

Prognosis. Death within five months, of phthisis. Died 5th August 1836.

Autopsy. Extreme emaciation. Right lung exten-

sively adhering to thoracic parietes, and very firmly superiorly. Several cavities in upper lobe of right lung, particularly in its upper portion, most of them empty, but some filled with a purulent fluid. A large cavity nearly empty, also in upper portion of lower lobe of left lung. Tubercles softening throughout lower lobes of right lung, and upper lobe of left. Lower lobes congested with bloody serum. Heart small, but not otherwise examined. Liver pale.

No 4.—J. Ayres. Ætatis 20. Of a fair complexion, and weak, delicate frame. Admitted 7th May, 1836.

May 13th. States that with the exception of a bowel complaint off Ceylon, from eating fruit, he enjoyed good health till he arrived in this country, four months ago. That since he has occasionally experienced pain, and beating in left breast, accompanied with some cough and expectoration; but not to any degree, till the day previous to admission. Denies dyspnœa altogether. The expectoration is adhesive, but not rusty. Aspect pale and sickly. Skin warm and dry on chest and abdomen; cool, and moist on extremities, particularly the lower. Tongue excited; appetite good; bowels open; urine, he says, natural; pulse 100, firm. Respiration 30, markedly abdominal.

Physical Signs. Thorax small, and left side half an inch less in circumference than right. Heart under 4th cartilage near the nipple, visibly heaving, and pulsating, as are also the arteries over sternum, and up to angles of jaw; at ankles, scarcely perceptible. Deficient resonance over all the left chest, but dull sound of heart only under 3, 4, and 5 cartilages, from half an

inch, on left of sternum to as far on left of nipple. Respiration puerile over all the right chest; obscure over all the left, accompanied with crepitous or subcrepitous rales, and nearly, if not extinct, in lower portion of left subscapular region. Loud bronchophony in left chest, posteriorly; also in some degree in left subclavian region. Heart's sounds loud in cardiac region, and very loud in left subclavian; very distinct also in left subscapular; soft bellows murmur, synchronous with systole, in right subclavian region. Impulse of heart inordinate, but perhaps more apparent than real. It is, however, heaving, and pretty strong, with pulse, as now, at 100.

Diagnosis. Nostalgia—"Pleuritis chronica—left side, and displacement of Heart."—Hypertrophy of left ventricle.

May 15th. It appears he had an acute affection of the chest, off the Cape of Good Hope, on his passage out; any such he positively denied two days ago. Nostalgia therefore cancelled; cause enough without. No prognosis is added; most probably postponed till after another exploration. The sudden move of the regiment will account for the rest. On his arrival here, the case we considered one of chronic pleurisy of left side, with tubercular deposition in consequence, running the usual course. Long before death, there were, in addition, cavernous rale under left clavicle, and the most perfect pectoriloquy, that is, it approached nearer to laryngophony, than any we have yet heard. Died 16th August 1836.

Autopsy. Great emaciation and pallor—Left lung, except lower posterior portion very intimately adhering

to thoracic parietes, insomuch that on separation the greater portion of the costal pleura came with it. In the lower part of that side there were six or eight ounces of pale green serum and the pleura in contact with it, presented a white, thick, macerated appearance, particularly the pulmonary pleura. Upper lobe of right lung also adhering, but easily separated by the fingers; fully a pint of greenish serum in that side; the macerated appearance of pleura still more marked; and the lower lobe corrugated up, as if it had been compressed upward by the fluid. Almost the whole of the upper lobe of left lung, converted into an irregular ragged cavity, nearly empty. Lower lobe, and upper lobe of right, studded with tubercles, softened, and softening. Lower lobes of right congested with reddish serum, but the lower edges of a much paler color. A small portion of lower edge of left lung presented a similar appearance. Heart was to the left of natural position, and its pericardium fixed by the adhesions. Both ventricles were decidedly hypertrophied, particularly the right. Notwithstanding the naturally attenuated frame of the subject, the right at thickest part, was $\frac{3}{8}$ of an inch; and the left betwixt $\frac{5}{8}$ and $\frac{3}{6}$.

A FEW NOTES

ON

THE THERMAL SPRINGS IN THE KONKAN.

BY

A. DUNCAN, ESQ.

Presented June 1837.

How far the line of Thermal springs in Western India extends, whether north of Surat, or south to Travancore, I do not know, but it traverses the Southern Konkan, and the hot wells at Veijrabhoy show its extension to the north; and, if I recollect rightly, I have heard of others far to the north of them. I have been informed, also, that similar springs exist in Malabar. Hence that line is one of great extent; but I must confine myself to that portion of it which lies between Dasgaum and the Southern Rajapoor, this being the extent I am acquainted with.

This portion of the line, then, is intermediate between the ghats and the sea, and the wells are generally from 16 to 24 miles, or thereabout, inland from the latter: one or two may be within even the smaller distance. In some places, as at Rajapoor, there is but one spring; at others, as near Mhar, there are several.

The temperature of the water, so far as I have had an opportunity of ascertaining it, is, with one exception, above 100.° This is in one of the wells near Mhar; it is 93° only: but it may be caused by having been allowed to get out of repair, and nearly filled up with mud, and the springs not being so copious as in the others, the water may consequently be cooled to this extent. Another there, is 105° ; a third 109°.

These springs between Dasgaum and Mhar are within (I should think) one hundred paces of the river on its west side, and about half way between those towns. Of the group, three at least, have been prepared for use, although now only one is kept in repair. A family was of old appointed to take care of them, and derives considerable advantages thereby; but the principal person of the family told me, that their duties were now limited to "looking at the water, and occasionally removing leaves of trees that had fallen in," but that they had nought to do with repairing, or keeping in repair the wells.

This well is about (I speak from memory) 8 to 10 feet in length, 6 to 8 in breadth, and 2 in depth, floored with strong planks perforated, to allow the water to issue forth, and the sides are built up with red stone. The water throughout is of the same temperature, viz. 109,° the same on the surface as in the perforations in the floor. The effect on going into it as a bath is to most persons disagreeable, and to some painful at the first: this is soon got over, and it finally becomes pleasant. Rather a considerable stream runs off from this well, which is forthwith diverted to the cultivation of rice ground.

These wells were formerly much frequented for a variety of ailments, cutaneous, dyspeptic, and rheumatic: they are much less so now, probably from only one remaining in a serviceable state. They, as a bath, afford a remedy of great power in the latter disease, in several of its forms. They excite the appetite, and are serviceable, consequently, in some forms of dyspepsia. I have also observed cases of debility without apparent lesion, or apparent disease, beyond perhaps a want of relish for food, considerably benefited by them. I am less acquainted with the effects produced on cutaneous ailment, but on some of these, I infer, a bath of this sort cannot be otherwise than beneficial.

The water of all these wells is, so far as I could ascertain, to the taste insipid and sulphury. Does this latter result from its insipidity, for I can find no trace of sulphur in it, nor of iron, nor of alkali, nor of iodine nor of any thing? And when it has been cooled and freely exposed to the air, it becomes a pleasant, and is a healthy water to drink. It would seem to be simply boiled water, yet it may contain foreign ingredients, although with my limited means I have been unable, to discover them.

I do not know the number of these hot springs, but from Rajapoor in the south to Saksee in the north, the number of places they are found in is, I am informed, ten; * of these, two are said to be insufferably hot to

* The localities of the ten springs, or groups of springs, are the following.

1st. In the talook Viziadroog, village Oonale, near Rajapoor, about 10 coss from the ghats, and 6 from the sea. This spring is on the face of a hill opposite Rajapoor, and a little

bathe in. Such appeared to me to be the case with that of Sungumeshwur; but I had no thermometer to measure it by.

Where is the *great fountain* whence this long line of springs issues, and where and what is the fuel by which it is heated?

Any one going from Bombay to Mahabuleshwur, desirous of seeing some of these hot springs, may very easily do so by either sailing upon the river in a canoe from Dasgaum, or by sending up a canoe to ferry him across (the road being on the east, and the wells on the west side of the river); or if on horseback, he could cross the ferry at Dasgaum, and ride past the wells to Mhar.

lower than the singular intermittent cold springs, over which a temple has been built, resorted to by crowds when in the hot months these numerous cold wells begin to flow.

2d, 3d, and 4th. In the talook Rutnagherry, and in the mahal Sungumeshwur, at the villages Rajwaree, Tooril, and Sungmairy, from the ghats about 7, 7½, and 8 coss; and from the sea, 13, 12½, and 12 coss. The latter is in the bed of a river, and that at Tooril is exceedingly hot. (It appeared to me to be almost at the boiling point.)

5th. In the Konedewree mahal, 8 coss from the ghats; 12 from the sea, village Arowlee.

6th. At the village Mat, Hatkumbe Mahal, from the ghats 12 coss, the sea 8. (The people are said to be afraid of using this spring on account of the increased consumption of grain and ghee it occasions, by causing a most voracious appetite.)

7th. Talook Sewurndroog, village Oonare, in the Natoe Palwan mahal, 18 coss from the ghats, 7 from the sea.

8th. Village Oonare, Jaffrabad Mahal, 15 coss from the Koombarlee ghat, 7 from the sea. One very hot; two others, moderate and fit to be bathed in, prepared for use.

9th. Talook Ryghur, village Savi in the Mhar pergunnah,

The valley where these springs are, is excessively hot; a high hill bounds it on the west, and effectually shuts it up from the sea breeze. Mhar is also a hot place: all the interior of the Konkan, indeed, is so. It is only from the effects of the vicinity of the sea, that it is tolerable to an European; and the further from that influence the more the air becomes heated, till, as you advance toward the mountain, every dry breeze that blows is as if it came over a burning furnace. In the night time again, the land wind comes, charged with the miasm generated in the recesses of the mountains, and stiffens every limb of him who is exposed to it. In these wells is a sovereign cure.

Dasgaum is one of the most tolerable places, so far inland to live in, that is to be found in the Konkan;

between Mhar and Dasgaum, by the river 28 miles from the sea, probably its actual distance is 20; and about 14 to 16 from the ghats.

10th. Talook Sankse, village Oonare, mahal Palee, 4 coss from the ghats, and 12 from the sea, at Reodunda.

I owe much of my information on the above points to the kindness of Mr. Harrison, (now Collector at Ahmednuggur,) who wrote to the different Mamlutdars on the subject, and then sent me an abstract of their answers.

The distances stated are to be taken as mere approximations.

Oonale, or Oonare, is the term by which the hot springs are known. Hence it has been given to so many villages contiguous to them. Some changes have taken place, I believe, in the territorial arrangements since the above information was obtained; so that the names of some of the Mahals may not now be the same as I have given them. Those of the villages, however, have of course not been altered.

(Signed) A. D.

I mean as to climate. The winds approaching towards west take the line of the river, and blow freshly, and less heated over it to that place. It is in the line of the river, which, however, at Dasgaum takes an acute bend to the south, to Mhar. But it is shut up from the north, being built on the southern base of a steep hill, on the top of which a small bungalow has been built by the Engineer.

Hence to those who might proceed to these springs for the benefit of their health, Dasgaum affords a more eligible place to live in, than either the valley or Mhar: but on the side of the river opposite to Dasgaum, and a little lower down, some good spots could be found for pitching tents, or erecting temporary habitations; and those who choose that mode, could canoe it pleasantly, to within one hundred yards of them, most part of the month.

The state of these wells is given as they were some ten years ago. It may be somewhat different now.

PRACTICAL SURGICAL CASES.

BY

W. B. BARRINGTON, ESQ.

Presented March 1837.

FATAL CASE OF TETANUS. Orunbie, a female, aged about 25 years, of a healthy appearance, admitted into hospital 23d February 1836, at 8 P. M. At 12 A. M. was knocked down by a bullock garrie, the wheel of which passed with considerable velocity over her left leg, tearing up the integuments from the internal surface of the tibia, and exposing the fascia investing the muscles posteriorly and internally, forming a flap of about six inches breadth superiorly, and extending from the knee to the inner ancle, presenting the appearance of an inverted letter ⊤; the transverse wound joining the perpendicular at right angles, was situated across the internal condyle of the femur. There was scarcely any hemorrhage from this extensive laceration, and the pain was much less than might have been expected; pulse regular; countenance calm. After removing some dirt with a sponge and water, I proceeded to draw the parts together, and succeeded in keeping the edges in contact by numerous points of the inter-

rupted suture and adhesive plaister, over which a moderately tight roller was applied, so as not to cause any uneasiness, and directions were given to keep the limb constantly moistened with cold water. After she was placed in bed, the following draught was administered.

R. Tincture of Muriate of Morphia, 20 minims.
Simple Syrup, half an ounce.
Camphor Mixture, one ounce.

24th. Slept a little during the night; complains more of a sensation of heat in the wound than of pain; bandage scarcely discolored; no nervous twitchings; tongue whitish; bowels not moved since admission; surface natural; pulse about 70 in the minute, but peculiar both as regards its strength and regularity, being at one time full throbbing and quick, and immediately after weak, slow, and languid; thirst; no appetite; lies pretty tranquil.

R. Sulphate of Magnesia, one ounce.

Vespere. Asleep; has slept two or three hours since morning; medicine operated four times.

25th. Has scarcely had any sleep during the night, from pain in the upper part of the wound; thirst less; took a little conjee yesterday; surface natural; tongue not so white; pulse 88, neither full nor strong, regular as to its beat; bowels moved three times. The bandage having become stiff I removed it this morning. The leg appears scarcely inflamed; the edges of the wound in contact; its temperature, superiorly considerably increased, inferiorly rather diminished. The application of cold water to the limb to be constantly repeated.

Vespere. Little or no change; pulse 104, not strong; tongue excited; surface rather warm; bowels not moved since last report.

R. Sulphate of Magnesia, one ounce.
Tartar Emetic, one grain.
Senna Mixture, six ounces.

Two table spoonfuls every second hour till it operates.

26th. Says she has had no sleep last night; medicine operated three or four times; tongue less excited; pulse 98, calm; surface cool. On taking off the cloth, some degree of fætor was observable, and a dark colored discharge from the superior part of the wound. Removed the adhesive plaister from this part, and found that there was no attempt at union by the first intention, the cuticle of the flap being quite black and detached, and the sutures having given way; rather more than the inferior half appears to unite; dressings not removed from that part. Simple

dressing to be substituted for the sticking plaister superiorly; the cold water to be repeated, the application of which is very grateful to her.

27th. Slept pretty well; pain much less; pulse 98; edges of the wound superiorly, nearly two inches asunder; inferiorly, union appears to go on; fætor less; discharge thin and reddish. Repeat the simple dressings and cold applications.

28th. Rested badly, but does not complain of much pain; pulse 88 regular; tongue cleaning; a little appetite; thirst less; surface natural; bowels moved once yesterday; edges of the wound rather more separated; superior angle of the flap sloughing; wounded surface where exposed, covered with healthy pus; a collection of red ichorous matter pressed from between the integuments and posterior muscles at the lower part of the calf of the leg.

Vespere. No change; bowels open.

R. Compound Tincture of Camphor, half an ounce.
Camphor Mixture, one ounce. H. S.

29th. Slept all night; feels a little headache this morning; does not complain of pain in the leg; tongue a little whitish; pulse regular; bowels open; surface natural; flap still separating and inclined to slough, corresponding surface covered with healthy granulations; discharge pressed out as yesterday, but of a more healthy appearance; edges of lower part of the wound, to the extent of 3 or 4 inches in contact. Continue.

March 1st. Flap further separated, and sloughing; healthy granulations shooting up on the opposite surface; discharge copious, but well formed; general health pretty good.

Vespere. Bowels not moved to-day; feels a disagreeable sensation of heat in the limb.

R. Sulphate of Soda, half ounce.
Tartar Emetic, half a grain.
Tincture of Opium, M. xxx.
Water, two ounces, to be taken immediately.

2d. Medicine vomited her shortly after taking it, and operated on her bowels twice, after which she slept well; wound presents a healthy appearance; appetite improving; thirst not urgent; surface and pulse natural. One strap of adhesive plaister to give support to the detached flap; simple dressing and cold application.

4th. Granulation healthy, and pus well formed; general health good. Repeat dressings, &c.

5th. Improving, flap has ceased sloughing. Repeat applications.

8th. 8 A. M. Continued to improve, till last night, when for the first time, in addition to the pain in the wound, she was seized with severe pain up the thigh, in the course of the anterior crural nerve, particularly at the superior part; within the last half hour there is inability to open the

mouth; some pain, but no rigidity of the muscles of the lower jaw; speaks tolerably well; countenance anxious; risus; little restlessness; pulse 106, small and compressible; respiration 46, irregular; bowels not opened since yesterday morning; wound looks well. A purgative enema immediately; two dozen leeches to the upper part of the thigh.

10 o'clock, A. M. The enema brought away a considerable quantity of fœces of a healthy appearance, which has given some relief; can open her mouth so as to admit the handle of a spoon; no rigidity or pain in any of the muscles; lies tranquil; leeches still drawing; pain in the thigh considerably relieved by them; thirst. Two parts of wine to one of water for her drink; a tobacco enema (consisting of tobacco leaves one scruple and boiling water eight ounces, to be infused for half an hour,) immediately when ready; a vapour bath. Catamenia appeared last night, when present is generally affected with pain in the back; cold moisture about the forehead and face; pulse 89, soft; respiration 36 improved; pupils not particularly dilated; abdomen rather hard; complains of pain about the umbilicus, which is tender on pressure.

12 A. M. Tobacco enema administered at ½ past 10, was returned in a few minutes without bringing any thing away; pulse immediately afterwards quick and fluttering, but in a few minutes 72 and regular; scarcely otherwise affected by the enema; has not passed any urine since last night, nor does she feel any inclination now; pain removed from abdomen.

R. Calomel, ten grains.
Antimonial Powder, five grains. S. S.

5 P. M. Passed a little urine a few minutes after 12; another tobacco enema administered at ½ past 3, which shortly after brought away a dark yellow copious fluid; a little wine and water produced vomiting; has just now complained of cramps in the lower jaw; starts momentarily; pain in thigh; can so far open the mouth as to show the tip of the tongue; took a little wine and water; complains for the first time of some difficulty in swallowing.

7 P. M. Can open her mouth sufficiently to take fluids slowly; startings continue, but less frequently; no rigidity or spasms of any of the muscles; pain about the lower jaw, with inability to raise the head; bowels not moved since last report; has had another enema, and a little wine and conjee.

Half past 7. Bowels moved, motion dark, watery and copious; pain at the pit of the stomach.

R. Calomel, ten grains; Antimonial Powder, five grains.

Extract of belladonna to be applied to the stomach.

12 P. M. Pain in the stomach not relieved; thirst; starts frequently; pain continues in the thigh.

9th. Passed a very restless night, without any sleep; continually start-

ing; pain extending from the wound up the thigh very severe; has had no distinct rigor, but the spasmodic startings are more frequent and severe; mouth distorted; angles drawn downwards and backwards; unable to open her mouth in the slightest degree herself, but the teeth can be so far separated as to allow her to take a little liquid; complains much of pain at the scrobiculus cordis, which is increased on pressure; bowels open, motions copious and dark colored; pulse 78, irregular; pain in the jaws and throat; foot of the affected side strongly drawn downwards; urine natural; surface moist; catamenia; wound for the first time presents an unhealthy appearance, discharge sanious. Simple dressing; a blister to be raised over pit of the stomach by the liquor lyttæ; tobacco enema immediately.

12 A. M. Two hours ago cramps in both hands, and also of the toes of the affected leg; pronunciation not so distinct; the enema, which was not administered till near 11 o'clock, scarcely affected her, but brought away a small quantity of dark fœces, being only retained a few minutes; spasmodic startings less since; lies on her back, with the affected limb extended, the heel drawn strongly upwards; no motion in the ancle joint; the constant starting has prevented her from sleeping.

R. Tincture of Muriate of Morphia, M. xx. Aq. half ounce.

2 P. M. Took the draught without difficulty; took ten drops subsequently, in five drop doses at intervals of a quarter of an hour, and has slept for the last twenty minutes without spasm. On a recurrence of the spasm, the morphia to be repeated in five drop doses, so as to keep up its action on the system. Pulse regular, and tolerably firm.

6 P. M. Slept nearly an hour; spasms once in about every four minutes; opened her jaw so as to show the tip of her tongue; has taken fifteen drops of the muriate, and has had just now another enema, which brought away some yellow liquid, without otherwise affecting her.

10 P. M. Still complaining of pain and spasms in the affected limb, which causes the starting; slept a little since last report; wine and water had been ordered for her common drink, of which she has taken but little; pulse 88, full.

Repeat the muriate, fifteen drops.

10th. Slept from 10 till 11; at 12 P. M. teeth closed, lower jaw immovable, but can take liquids from the projection of the upper jaw, spasms frequent, and worse; slight opisthotonos; feverish; pulse quick (120); bowels just now moved, motions fluid, scanty, and dark coloured; a glairy, reddish mucous-like discharge from the wound; painful. A pledget of lint soaked with laudanum to be applied over the simple dressing; the tobacco enema immediately it can be got ready.

12 A. M. Enema administered before 9 o'clock, was retained nearly 20 minutes, bringing away a dark liquid; almost immediately on receiv-

ing it the spasms became much lessened, and she opened her mouth nearly half an inch; pulse lowered; perspiration about the throat.

Repeat the morphine, twenty drops.

2 P. M. Spasms have continued, but less severe; another enema administered at 1 o'clock was retained nearly half an hour, and brought away a dark liquid in small quantity, accompanied with a little blood and slime; mouth has continued open; has slept for the last few minutes; eyelids half closed, disclosing the white of the eyes; tremulous motion about the lips; awoke by a severe paroxysm of pain; pulse quick; surface hot. Muriate of morphia to be repeated 20 drops. From this time she gradually became worse, and expired at 5 P. M. without having had a decided parosysm, but the spasmodic startings were more frequent and severe, till within a short time of her dissolution, previously to which she appeared to be free from pain, and retained her senses perfect till nearly the last moment.

The remedy chiefly relied on, in the treatment of this case, has been the frequent exhibition of tobacco enemata, so as to endeavour to bring the system, under the influence of its narcotic powers. Whether the patient would have recovered under any other mode of treatment, I cannot pretend to say; but of the numerous cases of traumatic tetanus I have seen treated, and the few I have treated myself, not only have they all proved fatal, but the sufferings of the unfortunate individuals have been so extreme, that the spectators could scarcely refrain from rejoicing at their death. It was far otherwise in the present instance. Her sufferings were incomparably less than the mildest case I had ever seen before, which circumstance alone, I conceive, renders it sufficiently important, to lay the details before the profession, independently of the well known powers of tobacco in effecting a cure in this most dreadful malady.

CANCER OF THE PENIS. There is no structure throughout the entire system that is not liable to become the seat of cancer; its danger generally de-

pends on its situation. The disease is not unfrequently found to attack the penis, and which, if not properly understood, and treated at the commencement, will most probably terminate in the loss of the organ, if not in that of the patient's life.

When the complaint has been fairly established, any measure short of amputation, so far from proving beneficial, has been found by experience, to have rather aggravated the symptoms; but as that is an operation, perhaps of all others, the most revolting to the feelings, the plan of treatment likely to *prevent*, is what surgeons should constantly keep in view.

In October last, a man, of the Gosaen caste, aged about thirty years, called at my house to consult me on an affection of his penis. On examination, I found it enlarged to about three times the natural size, the enlargement consisting, of numerous cauliflowers excrescences extending from the extremity of the glans to within about an inch and half of the pubis; evidently of a cancerous description, causing continued and severe lancinating pains, with great difficulty in making water, which came away *guttatim*, through two or three ulcerated orifices in the prepuce.

He was much emaciated, but the inguinal glands did not appear affected; tongue clean; pulse regular; appetite moderate; bowels open.

The disease set in about four years ago, having commenced with itching in the glans, which continued to increase, till at length it became painful: could never up to this period draw back the prepuce, and in consequence of this inability the cause of the itching and pain could not be discovered; but supposing there was

an ulcer on the glans, he applied some country medicine, without any benefit, for about nine months; when the prepuce suddenly opened, from ulcerative absorption, and discovered its inner surface and the body of the glans one mass of ulceration, which has continued increasing ever since; discharge thin, ichorus, and offensive.

During this time has been treated by various native doctors, and has three times been put under the influence of mercury. The nature and extent of the disease, at once convinced me, that amputation of the organ, alone could put an end to his sufferings, or perhaps save his life.

Upon informing him of my opinion, he willingly agreed to submit to the performance of any operation I might deem proper. Although there could be but little doubt, that the glans was in as equally a diseased state as the prepuce, yet, before performing the operation, I judged it prudent to make a free incision through the latter, that the positive state of the glans might more clearly be discovered; this of course was the cause of additional suffering and delay, but, the reason being explained, the patient willingly agreed to this previous step.

The glans having been found one mass of disease, I immediately performed the operation, with one stroke of the knife within about an inch of the pubis; four vessels were tied without any difficulty; the only application used, were cloths kept constantly moistened with cold water.

He passed his urine freely, but not in a stream, immediately after the operation; never used a canula,

but merely took the precaution of rubbing a little oil over the orifice of the urethra previously to making water. There was no hemorrhage. The cloths were scarcely discolored after the first two or three hours. The ligature came away within the fortnight, and he was discharged cured within one month.

What appears remarkable in this case, and now induces me to lay it before the profession, is the circumstance of the congenital phymosis. Mr. Hey, and several other surgeons, have noticed this complication, and by some, the malformation is considered a remote cause of the complaint. There cannot be a doubt, that the accumulation of the secretions, even when healthy, will ultimately prove a cause of irritation, and ulceration; but the fact of simple ulcers being converted into cancerous ones by continued irritation is well known.

That the venereal virus is not necessary to produce the complaint, is proved by the circumstance of the man having rigidly adhered to the tenets of his order, one of which is strict continence. The practical inference to be drawn from this case, is the almost absolute necessity of obviating in good time, the malformation of congenital phymosis by operation. There is every reason to suppose, that had this been done, on the occurrence of the itching, or even of the pain, the man would have escaped his subsequent miseries. I have seen one other similar case, in which likewise, amputation was found necessary.

WOUND OF THE THORAX. *6th December*, 1836. Goman Sing, government sepoy, admitted into the military hospital at about 12 o'clock last night, in consequence

of a sword wound penetrating the cavity of the right chest; situated about three inches below the clavicle, and two from the sternum; states that about an hour before, he was walking carelessly, with the point of the sword, (the scabbard of which was broken,) turned towards himself, and having tripped against a stone, he fell on the weapon, the point of which, he says, entered about two inches into his chest.

When brought into hospital there was not much appearance of hemorrhage (at least externally); the wound was gaping, and the egress of air was evident to my Assistant, at every inspiration; there was slight swelling around the orifice, but whether emphysematous or not, the Assistant does not know; no expectoration of blood; breathing scarcely affected; pulse weak and slow, and intermitted a short time after his admission; the wound was dressed with adhesive plaister, and the man placed in bed with his head rather raised.

I saw him for the first time, at 8 o'clock this morning; pain over the entire surface of the wounded lung, increased on speaking and taking a deep inspiration; respiration slightly accelerated; the motions of the chest and abdominal muscles scarcely visible; pulse 65, but full and strong. A very considerable degree of emphysema occupying the site of the pectoralis major, and extending towards the axilla, the posterior part of which is much swollen, and crepitates on pressure; the pain in the wounded part is increased on making any kind of exertion; rested badly; countenance anxious; skin cool; bowels not moved since the accident. Ordered venesection till the pulse was lowered, and the pain in the chest relieved; took away 12 ounces with

some difficulty from a tolerably large orifice, when the pulse became much softer, (still continuing 65,) and the pain in the chest alleviated.

R. Tartar Emetic, one grain.
Water, eight ounces.

To take one ounce every hour, so as to keep him in a state of nausea. A purgative enema immediately, and small punctures over the emphysematous parts.

6 P. M. Although he has had some cough, and the pain still continues troublesome on inspiration, he says he feels better since morning; on two or three occasions, when the cough was most troublesome, a gush of dark blood burst through the dressings; the emphysema is considerably less, and unattended with pain on pressure; pulse 80, not full, but rather sharp; bowels opened once by the enema; motions natural; has some appetite, and but little thirst; surface above the natural heat and dryish; the blood drawn exhibited a colourless serum in considerable quantity, with a crassamentum neither cupped nor buffed, of a preternaturally red appearance as to its surface, and dark below; took four ounces of the mixture, when it was discontinued from his body becoming cold, with a tendency to moisture, although there were no symptoms of nausea.

The tartar emetic mixture to be continued, one ounce every hour, as before. A purgative enema. And the venesection to be repeated, if either the cough, or pain become more troublesome. Congee diet.

7th. Pain subsided altogether at about 9 P. M.; cough much less troublesome; slept two or three hours; is now free from pain either in the lung or wound; emphysema has disappeared from the axilla, and is much less over the pectoral muscles, where there is still some crepitation; pulse 65, neither full nor strong; surface natural; tongue a little whitish; bowels moved once during the night; little thirst; appetite returning; took six ounces of the tartar emetic mixture without any visible effect.

Repeat the tartar emetic mixture, and to be kept perfectly quiet.

7 P. M. Has continued well; bowels open; took the tartar emetic mixture 6 times. Omit.

8th. Passed a good night; does not complain of any pain; coughed less; emphysema only in the neighbourhood of the wound, and decreasing; pulse 70, natural; surface cool and moist; tongue slightly excited; no thirst; wishes for something to eat.

Repeat tartar emetic mixture.

9th. Improved in every respect; emphysema much less. Omit medicines.

13th. Continues to get on well; emphysema nearly gone; dressings removed for the first time since the morning after the accident; wound closed; granulations healthy.

24th. Discharged cured.

WOUND OF THE DEEP PALMAR ARCH. The difficulties stated by surgical writers, of restraining hemorrhage, occasioned by a wound of the deep palmar arch, induces me to give a short account of the following case.

On the evening of the 23d December 1836, a Mussulman cook, aged 21 years, was brought to my house, bleeding most profusely from a wound in the hand, caused by the point of a knife having entered deeply into the palm, whilst he was endeavouring to open a cocoanut; the blood gushed out *per saltum*, and was not restrained in the slightest degree, by pressure on either radial or ulnar artery, singly, but was instantly checked by compressing both together.

From the situation of the wound, nearly corresponding with the carpal extremities of the metacarpal bones, and the pain referred along the course of the ulnar nerve, the largest division of which accompanies this vessel, there could be no doubt, as to the division of the deep palmar arch. As no particular vessel could be discovered on which to apply a ligature; before attempting to enlarge the wound, I determined to try if the hemorrhage could not be restrained, by local pressure. Having wrapped a pice in a bit of lint steeped in spirits of turpentine, I placed it on the wound, and, with a graduated compress and bandage firmly applied, succeeded in entirely suppressing the hemorrhage. The bandage was not removed till the sixteenth day after the

accident, though the suppurative process had set in several days previously. The wound was perfectly healed on the twenty-first day.

One case of *amputation of the leg*, below the knee, occurred in a female affected with osteo-sarcoma of the foot of eight years standing. The ligatures came away on the twentieth day, and the stump presented such a healthy appearance, that I yielded to her entreaties to be allowed, to go to her own home on that day. She was quite recovered within six weeks.

I have had but two opportunities of treating fractures, as lately recommended, without the use of splints, and was successful in both, beyond my most sanguine hopes. One was a fracture of both bones of the leg, about two inches above the ancle, caused by a horse falling on the limb; the other, of the humerus, a little below the neck, occasioned by a fall from the window. Bandages, cold lotions, leeches, purgatives, &c. were used in both cases. They recovered within the space of six weeks. The first case was that of a man of about 30 years of age, the latter a boy of about four.

Broach, 25th February, 1837.

NOTES *

ON

THE STATE OF MEDICAL AND SURGICAL SCIENCE IN THE COUNTRIES BORDERING ON THE INDUS.

BY

PERCIVAL LORD, M. B.

In Medical Charge of the Kàbul Mission.

Presented October 1837.

In all uncivilized nations, medical and surgical science may be briefly characterized, as the collection of simples, the exhibition of nostrums, the application of plaisters, and the performance of a few rude operations, in which chance and a beneficent Nature enable the patient to escape, or recover from the blunders of the practitioner.

How far it may be useful to enquire into such matters, may seem a reasonable doubt, though most persons will admit the interest that accompanies, an attempt to roll

* *Note by the Secretary.* The Society is further indebted to Dr. Lord, for a collection of the articles of the materia medica of the countries, to which these notes refer.

This collection has not yet been received; but should the catalogue reach in time, it will be published in the appendix to the present volume: if not, in that, of a subsequent volume.

back, as it were, the accumulated improvements of ages, and observe a science in its humble origin. Perhaps even utility may, in some measure, be conceded to such an attempt, inasmuch as the remotion of error is a fair syllogistic step towards the position of truth; and the full conviction which will be thus produced of the injury done a science, by receiving popular fallacies as established facts, and long propagated absurdities as the wisdom of ages, may induce us to consider how far we ourselves may not yet be similarly fettered, and excite in us an earnest desire to prove all things, to hold fast that only which is good.

With this apology I venture to offer the Society a few remarks on matters connected with medical and surgical practice of the countries, through which I have been lately passing, and hope that, accompanied as they are by a copious collection of the articles of their materia medica, they may afford a tolerably comprehensive, and, as far as my opportunities have allowed, correct view of the subject.

Perhaps few operations, even in a civilized country, excite or deserve more attention than that for the removal of stone in the bladder. I was fortunate enough to meet at Dera Ismael Khan, a man who was eminently renowned for his skill in this operation.

Having gained his confidence by a few small presents, and a great display of respect for his talents, he made no secret with me, but fully answered all my inquiries as to his mode of practice. He had no sound; his cutting instrument was a spear-shaped lancet, exceedingly rude in its construction. He ascertained the existence of the stone by introducing his finger into the rectum,

and if necessary, pushing down the bladder from above. Two stones which he produced, and which I shall forward for the inspection of the Society, were both of the same kind, both rough on the surface, and appear to belong to the variety termed mulberry calculus; but he stated that he had met with stones of every variety of color, and figure.

He had operated on about two hundred cases, of which seven or eight were women: he could not say how many children. Of these about twenty, all adults, had died. Death never followed immediately after the operation from hæmorrhage, but, when it did occur, was always preceded by intumescence of the belly, sickness of stomach, &c. &c.; in other words, the patient died of the subsequent inflammation, and this, he knew no means of checking.

Before proceeding to operate, he always insisted on the patient giving him a written certificate acquitting him of all responsibility, in case death should follow. The man was perfectly ignorant of anatomy, and proceeded in this simple manner, pretty much as our ancestors did before the days of Frere Jaques.

The patient was placed on the ground on his back, with his legs drawn up, and the knees held asunder by assistants. The operator introduced two fingers into the rectum, (one if the patient were a child,) and endeavoured to hook with them the stone, aiding himself by pressing down from above, with the other hand. When he had once hooked the stone, he stated, he was always certain of getting it out. For this purpose he pressed it down on the perinæum, making it project on one side or other, as its situation rendered

convenient. He avoided the raphé, as, he said, cutting there, destroyed the generative powers. Having made the stone protrude, he pushed in his spear-shaped lancet until the point met the stone, and then with the shoulder enlarged his opening, first upwards and then downwards, until the point which he moved along the stone, was found to have reached its edge in both directions. In doing this, he employed considerable force, and one of the stones, which I transmit, presents evident marks of the action of the knife in the operation; these the operator pointed out to me, explaining how they had been caused.

The knife is now withdrawn, and two fingers introduced, with which the incision is stretched, and torn until it will admit his second instrument, which is neither more, nor less than a large goat's, or antelope's horn. The point of this is entered above the stone, and the instrument caused to revolve, using the pubis as a fulcrum, and then, with the practitioner's whole strength, the horn, thus converted into a lever, is suddenly pushed back towards the patient's body, while the point revolving, of course, in the opposite direction, jerks out the stone through the aperture.

Such is the proceeding in all cases: the only difference made with women is, that the incision is commenced at rather a greater distance from the raphé; the finger in both cases being introduced into the rectum, never into the vagina. The only subsequent treatment, is to rub the parts over with oil, or, if the patient be of the better (by which I mean the richer) class, an ointment composed of common salt, turmeric, and the impure

carbonate of soda got from the *làna* or salt-plant, is smeared on.

The immense number of cases, operated on by this man, is a full proof that warmth of climate is not, as Dr. Marcet supposed, any protection against the common occurrence of this painful disorder.*

The number of deaths, as stated, is surprisingly small, but I am inclined to think they have been very much under-rated. The man is very ignorant, keeps no register of any kind, and merely gives his numbers by guess, and in a vague manner. Still he is nearly consistent in his proportions, for on asking him, at a separate interview, how many operations his brother (who is also a surgeon) had performed and how many patients lost, he replied 40 operations and 5 deaths, adding, there might have been one or two more. His father, he said, had operated in cases without number, and many of his patients had come from the remotest parts of Khorasàn. He was not aware, whether he ever cut into

* A non-medical gentleman once mentioned to me in the course of conversation, as a singular circumstance, that on his first arrival at Simla, whither he had gone for change of air, he found the call to empty his bladder, recurred almost every hour, whereas in Hindústhan once or twice a day was, perhaps, as often as was necessary. The recurrence was so frequent that he, at last, thought something must be wrong, and mentioned it to different friends, who all agreed in assuring him, that it was nothing more than what every one experienced on his first arrival from India. The explanation is obvious : the kidneys were then excreting all the watery matter which had previously been carried off by the skin when perspiration was more abundant; and the necessity is thus pointed out, of a careful inquiry into the state of the kidneys and urinary discharge before sending any patient to the hills.

the urethra or rectum, but some melancholy cases came before me in which, either from the operation or the subsequent formation of abscesses, both these opened into a common cavity, and dreadful ulceration and sloughing had supervened.

Stones, he said, were occasionally impacted in the urethra, and these he cut on, and removed without hesitation. I must add, in justice to my brother practitioner, that his scale of charges was extremely moderate: a poor man, he cut for stone for two rupees, a rich man, he said, usually presented him with a horse or a camel. But stone in the bladder is an object, as well of medical, as of surgical practice, and various mixtures are prescribed for the purpose of expelling the stone, and rendering the operation unnecessary. Most of these are rather likely to act as diuretics than solvents, still the alkali which they generally contain, may give them some of this latter quality also. I subjoin three prescriptions.

For Stone in the Bladder.

Take of Tookhmí Zurduk, (carrot seed,)
Tookhmí túrg, (radish seed,)
Tabushìr,
Illáchí, (cardamoms),
Bít Kabútur ka, (pigeon's dung,) of each equal parts,
Muska (butter,) 9. s.: make a paste, dose 4 mashas.*

For same.

Tookmí kúlfa, (*specimen sent,*) 2 tolas,

* It will be convenient, as a reduction to our standard, and sufficiently near for all practical purposes, to consider 1 *masha* as equal to 15 grains, or quarter of a drachm, troy weight, and one *tola* as equal to 3 drachms. The tola will then be divided into 12 mashas.

Jírí Sufaid, (anise seed,) 2 tolas,
Jaô kar, (salt of jao,) 6 mashas,
Rewun khutaí, (rhubarb,) 1 tola.
Dose 4 mashas.

Jaô kar is made by burning jaô (barley), throwing the ashes into water, straining, and evaporating until crystals begin to form: it probably must contain carbonate of potash, with a little silica and carbon.

For same.
Sungí Yahúd, 1 tola,
Jaô kar, 1 tola,
Tookhmí túrg, (radish seed,) 2 mashas.
Make powder: dose 2 mashas.

Of the *Sungì Yahood,* called also *Hujr-ùl-yahùd,* I have not as yet suceeded in procuring a specimen, but I believe it to be a sort of calcareous conglomerate. It is probable, however, that a medicine so celebrated through oriental countries, is already known to the Society; indeed, if my memory serves me right, I have seen a published account of it somewhere, though I find it impossible just now to refer.

Another affection, for which native surgical skill has provided a remedy, is piles. These, my Dera Ismael Khan acquaintance removed by ligature, according to the most approved proceeding. He passed a needle containing the ligature through the hœmorrhoid, which he then tied tightly round the neck. Not satisfied with this, he next sprinkled the tunic, over with *sunkia,* (white oxide of arsenic,) and said, that in doing this it was necessary to be cautious, that none fell to either side, as it would produce ulceration. After this, if much pain was complained of, he applied a poultice of

juwàr and *punìr*, (a *physalis* of the order *solaneœ* see specimen sent,) and stated that, the tumour generally fell off, within seven days. His only application to the ulcer that remained, was an ointment composed of butter and *bang*. He had not known any ill effects to follow, and considered this, in general, a safe operation.

But he was also skilful in removing cataract, though his success, if he ever did succeed, was inexplicable on any principles known to us. Of the eye, and its contents, he had not the remotest idea. Cataract he called and considered *purdah* (a screen); to remove that screen, he announced, as the object of his operation, but conscious, that he had never really succeeded in withdrawing this screen, he usually, before the operation furnished himself with a small shred of onion peel, which he managed to wrap round his instrument, so that on withdrawing it from the eye. and plunging it into a vessel of water, the shred might appear floating on the surface, thus affording the most indubitable evidence of his skill and success.

His implements were certainly wretched. He had an old lancet with which he made his incision, and, to prevent it entering too far, had it wrapped round with cotton thread, to within about two lines of the top, so as to leave little more than was sufficient, for cutting through the thickness of the sclerotica. His incision was always made from below, directing the patient to look up, and entering the lancet over the lower eyelid into the white of the eye, when he had it well exposed.

He did not seem particular as to the exact spot; any where, between the cornea and the reflection of the conjunctiva, was all the same to him. Having made his

incision, he withdrew the lancet, and proceeded to introduce a long copper probe, on the top of which, was a sort of irregular, triangular pyramid blunted at the point, to prevent it, as he said, doing mischief.

Now commenced the serious business of the operation, for taking the handle of the probe in his fingers, he set to, twisting it round, and round until, by some chance, one of the corners hitched against the lens, and drew it out of the axis of vision. In this process great part of the vitreous humour was discharged, dreadful laceration occurred, and, not unfrequently, blood flowed freely.

The minute the patient exclaimed, he saw, the instrument was withdrawn, (the lens being never extracted, but merely reclined, or depressed,) a piece of cotton dipped in a mixture of opium, oil and turmeric was dabbed on the eye, and the operation declared to be finished. Occasionally the additional precaution was taken, of making three issues with a hot iron, one behind, and two over the eyes; but no further treatment was known or thought of. It will readily be believed that, after such operations, the occurrence of inflammation of the globe is almost inevitable. This they have no means of checking, and, if I may judge from the number of destroyed eyes that came before me, I would say that this operation in their hands ends far more frequently in the total destruction of the globe, than in the restoration of even an imperfect vision.

The only other operations known to native surgical skill are bleeding, which is more commonly, however, left to the barber; opening abscesses, cutting out bullets, applying the actual cautery, reducing dislocations, and

setting broken bones. This latter is done by tying a bamboo stick on the fractured limb: if the limb happens to be in good position when the stick is tied, it heals straight; if not, deformity of course results.

Of their medical art it scarce becomes me to speak after a transient observation of a few months, as a venerable practitioner at Pind Mulik Oulea, in reply to my enquiries on the subject, told me that he had spent thirteen years learning his profession, before he ever ventured on a single prescription. I was however, a little re-assured when I found, he had employed his whole time in committing to memory four books; viz. first, the Jumguntuk, which gives a history of the structure of the body; second, the Kok-Shaster, which treats of the diseases of females, and other matters connected with the sex; third, the Bèd-Munùrut, which gives prescriptions; and last, the Nidàn, which teaches the different forms of disease.

As a specimen of what he had learned, he told me that there were 18 kinds of gonorrhœa, and 84 of belly-aches. I was astonished at this abundance, but was informed that the variety was not in the nature, but the situation of the pain, the abdomen being divided into so many distinct regions.

Further, to impress me with an idea of his anatomical skill, he informed me that the arm contained three principal veins, namely, Budsalìk, which went to the eyes, and was to be opened in all diseases of the head; Sir-ì-rù, which, having its source in the liver and heart, was to be opened in cases of jaundice, palpitation, &c.; and Haftandàm, which went, he did not exactly know where, but which was to be opened for rheumatism

only. A Mùltan practitioner had recounted to me seven veins, but, not having taken them down at the time, I am unable to report on the remaining four.

To leave theory, however, and proceed to practice, I had, with a view to obtaining, a rough idea of the prevalent forms of disease, as we were leaving the plains, directed my Assistant to take an indiscriminate account of the complaints of all who applied for medical relief in a single day at Dera Ismael Khan. The following is the result:

July 2, 1837. Fever 7; Splenitis 14; Dropsy 3; Dysentery 5; Diarrhœa 3; Tape-worm 2; Opthalmia 9; Cataract 3; Other diseases of the eye and its appendages, such as granulations, opacity obstructed, lachrymal gland, &c. &c. 53; Pulmonary affections 19; Gravel and other urinary affections 14; Syphilis and Gonorrhœa 5; Dracunculus 3; *Total* 141.

There were besides several cutaneous cases, of which no account was taken, but among them were, to be found a few specimens of the severer forms of lepra and impetigo. The most remarkable feature in the above list is the enormous preponderance of eye complaints; and on enquiring respecting these, I found, that except the rude operation for cataract above described, the use of the actual cautery in the vicinity of the organ, and the application of a few herb fomentations, native skill was actually without a remedy.

The next thing that attracted my attention was the occurrence of dracunculus, a disease which, since my entrance upon the Sindhian territories, I had not before met with. Three persons affected with it, are mentioned as having applied to me in one day at Dera, but after passing Kàlabágh, and turning to the right amongst the elevated plains, north of the Salt Range, I

found it of exceedingly frequent occurrence. Goître, on the contrary, of which I met with two or three cases at Dera, being traced up to Kàlabàgh, where it is very abundant, seems to turn off, and find its most genial climate amongst the hills to the left; insomuch that whilst Kàlabàgh itself, Ták and Bunnoo, are said to have from 15 to 20 per cent, or nearly one-fifth, of their entire population affected with this disease; The plains of the Salt Range referred to, have not more than one in a hundred, and that most frequently a woman or child.* Of its hereditary nature they knew nothing: their most favourite remedy was the water of a mineral spring, (a specimen of which I have forwarded to the Society,) but they also had some faith in the following mode of treatment.

Take of the juice of the *Kùar bùtì* (aloe perfoliata) 6 mashas. The patient is to drink this, fasting for 21 successive days, and is to have the actual cautery applied on the sides of the tumour.

Dracunculus was said to be particularly common in two villages, Dùlàr and Rotárì, in the neighbourhood of Futeh Jung, and was attributed by all the native practitioners to drinking the rain water collected in *dhunds*, or tanks. They said that its usual period of attack was in *Gàwun* and *Budro*, (August and September,) and that those towns which had an abundant supply of well or river water were generally free from it.

The treatment was as follows. Internally, the cast slough of a snake cut into small pieces and made into

* I hope in a future paper, to be able to give some information as to the geological differences of these regions, which may afford us assistance in our etiology.

pills with jaggery and borax ā ā: 1 pill morning and evening. Externally, an onion roasted and split, covered with powdered borax and applied over the worm. If the worm breaks, a poultice of nìm leaves is resorted to, or in default of those, the leaves of the mudar are used.

As I am writing, a singular circumstance connected with guinea-worm has come to my knowledge, tending to show that its origin may be from without directly, and also that the period of gestation, if I may so express myself, may be considerably shortened. On the night of the 6th, 7th June, I had crossed the Indus at Dera Ghàzè Khan, with a view to proceeding to Mùltàn. Our tent was pitched on the river's edge, in a low sandy situation, which had lately been under water; and where there were swarms of flies. I was awoke at midnight by the mess-waiter, Shaik Bùdan, who said he had just been bit by some (kèra) insect, and that the pain was very severe. On examination I found his left foot and ankle considerably swollen, and close above the ankle was a small scarcely distinguishable mark, where he said the wound had been inflicted. Thinking it probable that a scorpion had stung him, I treated it accordingly. Next day he was tolerably easy, and able to travel on horseback, but the subsequent morning, on reaching the ground, I found that he had been attacked with a most intolerable itching all over his body. This subided towards evening, the swelling also left his leg, and he continued, to all appearance, quite well, and able to walk as usual. But this morning (August 9th) he came to me saying, that the same leg yesterday had been swollen and painful all day, that towards midnight it had burst, and

from the opening he had drawn out and secured the head of a guinea-worm, which he showed me, twisted in the ordinary manner round a piece of string. The man had never been affected with guinea-worm before, nor, to his knowledge, had any of his family. The situation of the guinea-worm is in the same leg, and, the patient himself says, at the very same point where the wound was inflicted; to me it appears an inch or so higher up. I have myself no theory connected with this subject, but state the fact, in the hope that those gentlemen who have directed their attention more particularly towards dracunculus, may be able to find something analogous in their own experience.

Cutaneous diseases are generally treated in such a manner as, if persevered in, would, I should suppose, in all probability, convert even a trifling itch into an inveterate ulcer. Take for instance the following prescription for ring-worm.

Chúna, (lime,)
Girú, (ochre,)
Hurtál, (orpiment,) of each 3 mashas,
Sirkah, (vinegar,) 1 tola.

Make into a ball, which dip in water and rub over the spots, having previously rubbed them with dry cow-dung until the blood appeared: or sometimes, by way of variety,

Purified Sulphur.
Old Jaggery, and
Bifáka Kuraya (the earth of a wasp's nest.)

Equal parts, made into a ball, and applied as above. In both cases the ball is to be rubbed on for an hour, after which the part is to be well washed with cold water.

But medical science, I am sorry to say, is here much more frequently employed, in inventing mixtures supposed to impart increased powers of sensual indulgence,

than in its truest and noblest end, that of providing remedies for disease. Such mixtures are considered the triumphs of the art, and for these, practitioners receive the highest rewards; it is therefore, perhaps, sufficiently natural, that they should have engaged so much of their attention. In proportion to the high demand for them, is the difficulty of obtaining an explanation of their contents, nor was it without considerable persuasion, and the gift of, I know not, how many empty bottles, (here a highly-prized present,) that I succeeded in getting the following, an undoubted original, composed expressly for the Nuwab, who ruled the Deraját previous to the Sikh invasion, and the birth of whose child was attributed, both by himself and his courtiers, to its potent influence.

Take of Shingruf, (cinnabar,) 1½ tola.

Tie it up in a cloth, and put it in a vessel containing a maund and half of milk. Boil slowly, until all the milk is boiled away. (By this proceeding the Shingruf is supposed to attract to, and concentrate in itself the whole nutritive qualities of the milk.) Then place it in ¾ maund of onion water, and repeat the same process. (By this it is supposed to acquire the heating qualities of the onion.) Then take purified opium 4½ tolas; dissolve in water, and boil Shingruf a third time in this water. (By this it becomes intensely stimulant.)

But now comes the grand invention.

Take five chickens, bray them to a soft paste in an iron mortar, picking out all the bones; add as much biláwa (marking-nut) as shall equal the weight of the flesh, mix intimately, and divide all this into ten parts.

In one of these parts place the Shingruf, wrapping it up as in a ball; cover it over with flour and fry it in ghee, until the ball becomes thoroughly browned. Then take out the Shingruf, transfer it to another ball, and fry, and so on, till the Shingruf has been fried in all ten parts successively. The balls may now be thrown away, and the Shingruf is fit for use. For this purpose reduce it to powder. The dose is the weight of one grain of rice, mixed with butter, and washed down with one seer of milk.

This the practitioner told me, he had prepared for the Nuwab, as the most powerful of all aphrodisiacs, and added that he had kept a little dose for himself, the efficacy of which perfectly astonished him. In more ordinary cases the following is prescribed, and considered to have great virtues; it undoubtedly contains a sufficiency of stimulating ingredients.

Take of Shingruf, (cinnabar,) 3 mashas.
Afiun, (opium,) 3 mashas.
Bukrí ká pittá, (bile of goat,) 7 mashas.

Place the opium and cinnabar in the bile in a shady place until it dries; —then add of

Jayaphul, (nutmeg,) 1 masha.
Kaysur, (saffron,) 1 masha.
Long, (cloves,) 1 masha.
Tookhmí Bung, (seed of *canabis sativa*,) 1 masha.
Tookhmí Dhatúra Siyá, (seed of *dat. fastuosa*,) 1 masha.
Kustúrí, (musk,) ½ masha.
Postunk, (skin mudar-plant,) 1 masha.

Rub them all for 3 pahar (9 hours) in a mortar, moistening them from time to time with bang-water q. s.

Then divide the mass into pills, each the size of a grain of gram. The dose is one pill, taken with milk, and its efficacy will be perceived within an hour.

But to return to our more legitimate object, the treatment of disease, dysentery is an affection rather common in the countries through which I have passed; and as the treatment of it consists altogether in the use of strong astringents, occasionally assisted by the application of the actual cautery on the abdomen, the mortality can scarcely fail to be very great. The idea of using purgatives in such a disease seems never to have occurred to them, and they shook their heads most incredulously, when I ventured to hint to them, the benefits to be derived from this class of medicines. The following

prescription is much relied on by native practitioners, and in common cases of diarrhœa or colicky pains, accompanied with profuse mucous discharge, I have no doubt that to a certain extent, it deserves its fame.

Take of Halléla Siyah, (myrobalan nut,) 3 mashas.
Zunjubíl, (ginger,) 6 mashas.
* Kurú, 3 mashas.
Tookhmí Ambh, (kernel of mango,) 3 mashas.
Tookhmí Jumbú, (specimen† A 2,) 3 mashas.
Pukhán béd, (gentian?) 3 mashas.
Bilgárí, (specimen B 99,) 3 mashas.
* Dhéla dúp, 3 mashas.
Inderjao sherín, (*nerium anti-dysentericum*—specimen B 113,) 3 mashas.
Muthán, (specimen B 6?) 3 mashas.
* Puthus, 3 mashas.
Káth, (catechu,) 3 mashas.
* Jubboo sher, 3 mashas.
Lod Sufaid, (specimen B 53,) 3 mashas.
Jayaphul, (nutmeg,) 3 mashas.
Misrí, (sugar,) 2 tolas.

Make a mass, which divide into balls, containing each 3 mashas. One of these is a dose.

Mercury, except in venereal cases, is not much resorted to: indeed, the practitioners seem afraid of it, and not without some reason, as the people of these countries would appear to be in an extraordinary degree susceptible of its influence.

A young sipahee, who accompanied me to Mùltan, was seized with fever on the march. As I was away from the mission at the time, I happened to have no medicines with me, but a few common fever pills, which

* Of these ingredients I could not procure any specimen, or any clear explanation of their nature.

† The letters A B refer to the catalogues of specimens which accompany these notes.

my Assistant had made up, and a few powders of calomel and jalap. Of these I gave him one containing 5 grains of calomel as a purgative, and next day three pills, each containing 2 grains of calomel and 3 of antimonial powder. The following day his fever was gone, and his gums, he said, slightly affected. They certainly looked red and spongy, but though I could scarcely attribute it to eleven grains of calomel, (the entire quantity he had taken,) yet I thought it safest to intermit, more particularly as there was no return of the fever.

It is perhaps fortunate I did so, for a salivation ensued of twelve days continuance, and so severe, that I at one time was seriously afraid that a large part of his gum would slough away. He, I am happy to say, eventually recovered; but the case shows how much caution is necessary in administering calomel to natives. My Assistant related to me a case which had occurred to him during my absence, in which three grains given to an old woman, had made her mouth so sore, that she came back some considerable distance solely to abuse him for his prescription.

The preparations of arsenic are generally used only as external applications, but I was astonished to find that the *Zurd Sunkiah*, yellow sulphuret of arsenic, was sometimes employed in small doses (they said *half rutty*) for obstinate cases of intermittent fever. I certainly was not prepared to find Dr. Fowler's specific, brought into practical operation in the Deraját.

It only remains for me to say a few words, more particularly regarding the specimens I have forwarded to the Society. With a view to show the medical resources

they afford, and also, by inversion, the nature of the diseases to combat which they are principally required, I have made a classification of them, exhibiting, in parallel columns, the relative strength of the Sindhian materia medica as compared with that of Buhawul Khan's country and the Derajat. It is only necessary to add, that as one medicine is frequently supposed to have several uses, the number of uses will necessarily exceed that of the specimens sent.

Classification of Native Medicines according to their supposed remedial effects.

	Sindh medicines contained in baskets No. I. II. III		Buhawulpur and Derajat medicines contained in baskets No. IV. V.	
1.	Purgative Medicines	11		15
2.	Emetic			
3.	Mucilaginous and Cooling.	13		21
4.	Aromatic and Carminative.	12		11
5.	Aphrodisiac, tonic, and astringent	21		59
6.	Fever, Splenitis, &c.	11		8
7.	Rheumatism	11		4
8.	Cough	5		10
9.	Venereal and Gonorrhœa	6		4
10.	Vermifuge	2		2
11.	Ophthalmic applications	6		3
12.	Lithontriptic, diuretic, &c.			5
13.	Bite of a Snake			3
14.	Miscellaneous, including cataplasms, applications for hæmorrhoids, and other externals, together with a few medicines used for enchantment, casting out devils, &c.	15		18

I have introduced the class "emetic" above, because I had fully ascertained that such medicines were employed, though up to the day of making up my parcel I had not been able to obtain a specimen, or ascertain what article was used for the purpose. I have since succeeded in getting a nut called *madful*, one of which is a full emetic dose for a man, and half or less for a child. The common blue stone is also (I have learned) used for the

same purpose, though rarely, on account of the great violence with which it acts.

A specimen of the *madful* I shall forward to the Society whenever an opportunity may occur. For all details connected with the specimens sent, I must refer to the catalogues, in which I have entered whatever information I could obtain respecting them.

In conclusion, I would venture to express a hope, that the novelty of the subject may have been such as to form some apology for the many defects in the mode of treating it, and that the Society will do me the honor to receive the paper, in the spirit in which it is offered, as evincing an anxious desire that my humble efforts may be made in any way available, towards promoting the excellent objects which the Society has in view.

Attok on the Indus, 9th August, 1837.

A

SELECTION

OF

CASES OF VIOLENT DEATH

WHICH HAVE FORMED SUBJECTS OF INVESTIGATION

BEFORE

THE CORONER OF BOMBAY.

BY

J. F. HEDDLE, ESQ.

Presented November 1837.

The cases which I beg to submit to the Society in this communication must necessarily be incomplete as medical histories, for in general, when death occurs under circumstances that necessitate judicial inquiry, it is only after the fatal issue, that a medical investigation is called for. The previous symptoms are therefore seldom witnessed by the medical man, and his inquiries must be confined principally, to the inspection of the dead body, anatomical dissection, and the examination of the contents of the stomach, intestines, &c. in those instances, where poisoning is suspected to be the cause of death.

I am induced nevertheless to offer these sketches imperfect as they are; for on the subjects to which such cases refer very little attention, as far as I am aware, has hitherto been bestowed in this place. However, among

a population so large, and so mixed as that of Bombay, instances of death, caused either by criminal interference, or accidental violence, must not unfrequently occur, and these, becoming the subject of medical investigation, are capable, if duly recorded, of affording useful information on the character of the community as respects crime, so far as that subject is interesting to a medical man, and of furnishing useful facts to the science, especially in its application to legal medicine, and medical police.

Of the cases which I have selected for this contribution, in two, death was caused by the administration of arsenic ; in four, death arose from laceration of the spleen, caused by blows inflicted on the abdomen; the remaining two were cases of accidental death, wherein laceration of the liver, caused by violence externally applied, gave rise to profuse hemorrhage, which destroyed life.

CASES OF POISONING.

1. In the month of June 1835, I was requested by the Coroner to examine the body of a woman, who had died under circumstances which created suspicion, that death had been caused by violence.

I found the subject lying in a temple, in that part of the native town called Kamatteepoora. I could obtain only an imperfect account of the symptoms under which, the deceased laboured, previous to death. From that account I ascertained that she had been severely affected all the night before by violent pain, vomiting, and purging, under which symptoms she died. From the appearance of the body, the deceased must have been about 30

years of age. Well marked symptoms of elephantiasis were observable on various parts of the body, viz. the face, fingers, and toes. The joints of the latter were distorted, and undergoing the process of separation; the face was affected with tuberculous swelling. The countenance exhibited an expression of extreme anguish; the corneæ appeared flaccid, as if the contents of the eye had been partially evacuated.

The viscera of the head, and chest were apparently healthy. On laying open the abdomen a considerable vascularity of the peritoneal surface was observed, and, on making a small opening into the stomach, the inner coat of that organ presented an intense redness. I therefore, suspecting that the effect had been produced by some irritant poison, carefully removed the stomach with its contents, for more minute examination. The inner coat of the duodenum exhibited for some extent a redness similar to that observed on the inner surface of the stomach, but not so intense. On the other portions of the intestines no such appearance could be distinctly observed. These were the principal morbid appearances noticed.

Before carrying away the stomach from the place where the body was examined, I endeavoured to find out, if any remains of food, lately taken by the deceased, or any matters ejected by vomiting, could be discovered in the apartment, but the latter, and every vessel I could find in it, had been carefully cleaned and arranged. The body had been removed before my arrival, from an inner room to the principal apartment of the temple. I searched the former, but without success, as it also had been carefully cleaned out.

I prosecuted the examination of the stomach and its contents on the following morning, the former examination having taken place late in the evening. Besides the redness which the mucous coat of the stomach uniformly exhibited, there were several blotches of a darker color than the rest, which appeared to be caused, by the extravasation of blood, in larger quantity than on the other portion of the surface, where the redness was less deep. On inspecting the mucous coat closely, fine grains of a white powder could be distinctly observed, spread equally over the surface. These grains were easily removed with the mucus, on scraping the surface. The contents of the stomach, consisted of about a pint and a half of watery fluid, tinged with blood, and mixed with mucus; a quantity of a white, opaque, gritty powder in angular particles, and clots of tough mucus, in the centre of which were imbedded, grains of a coarse powder similar to that found loose, among the more fluid contents. No remains of food could be discovered.

Portions of the white powder collected from the situations in which it was observed, viz. that entangled in the mucus-clot, that adhering to the villous coat, and that suspended loose in the fluid, were separately thrown into a small quantity of water, and immediately sunk to the bottom of the glass. The separate portions were then dissolved in boiling distilled water, to which a few grains of subcarbonate of potass were added.

To a portion of this fluid a drop of the lunar caustic solution was added, which produced the lemon yellow precipitate of the arsenite of silver; a solution of sulphate of copper added to another portion of the same fluid, threw down the grass green precipitate of arsenite of copper.

To other portions of the solution, acetic acid was added to slight excess. A stream of sulphuretted hydrogen gas, (prepared by pouring diluted muriatic acid on sulphuret of antimony,) was then passed through the solutions, and in each produced the characteristic yellow precipitate of the sulphuret of arsenic. The nitrate of silver, and cupreous tests were varied by employing the ammoniacal nitrate of silver, and ammoniacal sulphate of copper solutions, to solutions of the suspected powder prepared without the addition of the alkaline sub-carbonate; and precipitates similar to those above observed were produced. The precipitates were then collected and dried, and a portion, combined with a flux, composed of carbonate of soda and charcoal, was introduced into a test tube, and on the application of heat the grey metallic crust of metallic arsenic, was observed on the side of the tube. The sanguinolent fluid, found in the stomach, was examined by similar tests, and showed the presence of arsenic.

From the morbid appearances above described, and the result of the chemical examination of the contents of the stomach, I had no hesitation in deciding, that the deceased had been destroyed by arsenic, whether taken or administered with a criminal intention, or on account of the disease with which she was affected. The powder collected in the stomach amounted to forty grains.

It appeared, from the other part of the evidence, that the deceased had lived as a concubine, with a Byragee, who had charge of the temple, in which the body was found. This man was known to deal in drugs, as many of the same class do; but I believe the Coroner's Jury could find no evidence to convict him, although there

was strong suspicion that he had administered the poison.

The magistrates, as soon as they became acquainted with the facts, caused the Byragee to be apprehended. The officers of police, at the time he was seized, found on his person (or as he was in the act of throwing it away) a lump of a white substance, which I was requested to examine, and which proved to be a mass of white arsenic, about eight or ten ounces in weight; a part of the surface appeared more fresh than the rest, as if a portion of the lump, had been recently broken off. The man had likewise in his possession a basket containing a variety of drugs, principally of a mineral nature; such as the native sulphurets of arsenic, (orpiment and realgar,) sal-ammoniac; also burnt alum, gypsum, and other substances of an inert nature, intended evidently to conceal, the dangerous properties of the more active. I found, too, in the basket a pair of small scales and a set of weights.

This man was afterwards tried before the Supreme Court, and acquitted.

2. The second case which I shall give, occurred in the month of March last. The body of a Hamaul, of the Kamattee caste, was the subject of this inquisition. I was informed, when I arrived at the house where the body was lying, that the deceased was servant to a respectable native family, in whose house, during some feast which took place a few days before, a shawl had been stolen.

To discover the thief, a juggler was called in, who administered to three or four persons suspected of the theft, among whom was the deceased, a portion of

some substance, which, however, produced no effect, either in bringing about a confession of guilt, or in causing any unusual symptoms, in any of those who had partaken of it. The juggler was therefore, called a second time, and on this occasion he administered to the same persons, something mixed with ashes and rice, which, soon after it was taken, produced violent vomiting, and pain in the stomach in all, who had swallowed the substance. Three of the people were taken to the Native General Hospital, and eventually recovered ; but the deceased was too ill to be removed, and after suffering severely from violent vomiting, purging, pain, and convulsions, expired on the evening of the day, on which he had partaken of the powder given to him by the juggler, the substance having been taken in the forenoon.

The deceased seemed to be a middle aged man: there was no appearance of long standing disease: the body, although it had lain over night, (it was on the afternoon of the day succeeding that, on which death occurred, that I examined it,) was still quite fresh, and not only, did not exhibit the slightest sign of decomposition, but was destitute of the cadaverous smell which is generally perceived in dying persons, even before life is extinct. There was present the same morbid physiognomy as observed in the last case, the countenance exhibiting a striking expression of pain : the cornea also, as in the preceding case, assumed a flaccid appearance.

The viscera of the chest were apparently sound. The peritoneum was slightly vascular. On opening the stomach, the inner coat presented a deep red color, the substance of the coat itself being in a pulpy state. Six ounces of fluid blood were contained in the stomach,

besides several clots composed of tenacious mucus tinged with blood. These, when examined, were found to envelop a quantity of a dark grey powder, which was carefully collected, and with the stomach, and the fluid blood, taken to my house for further examination. The inflammatory redness which affected the inner coat of the stomach, was found to extend along the mucous coat of the upper portion of the intestines. I was shown a spot on the floor on which a portion of the matter, ejected by the deceased in vomiting, had been thrown. Nothing, however, remained, but a damp stain caused by the fluid, the rest having been previously washed away.

I then proceeded to examine the powder found in the mucous clots which were contained in the stomach. A portion of this was found to consist of rice, which swelled when soaked in water, and could be easily recognized by the form of the particles; another portion evidently consisted of carbon, or charcoal, finely comminuted; there was a third substance, composed of white angular grains, somewhat resembling the rice, but which when thrown into water, sunk to the bottom of the glass, at once. This substance was subjected to the same experiments as detailed in the foregoing case, and proved to be arsenic. The blood which was taken from the stomach was also found to be impregnated with arsenic; it remained fluid for two or three weeks, without manifesting the slightest appearance of putrescence, then gradually dried into a solid paste, and is still in my possession, quite free from any taint, and in a perfect state of preservation; affording a remarkable instance of the anti-septic property of arsenic.

The juggler, who belongs to the same caste as the person suspected to have administered the poison in the preceding case, was tried before the Supreme Court on a charge of manslaughter, and sentenced to seven years transportation.

CASES OF DEATH FROM LACERATION OF THE SPLEEN.

1. In the month of August 1836, I was called on to examine the body of a woman, who, I was informed, had died on the preceding night under the following circumstances.

Her son-in-law, a Portuguese, with whom she lived, having returned home late in the evening, in a state of intoxication, became irritated on account of the absence of his wife, the deceased's daughter, and in his passion, beat the woman over the abdomen, with a light broom without a handle, of the description commonly known here as the Goa broom. The deceased attempted to stagger to the house of a neighbour, but, after proceeding a few yards beyond the door of the house, she fell down, and expired in a few minutes.

By the appearance of the body, the deceased must bave been about 45 years of age, and apparently of feeble constitution. After a careful examination, I could not discover the slightest scratch or contusion on any part of the integuments. The abdomen appeared to be moderately distended. On making an incision into the abdominal cavity, it was discovered that this distention arose from a profuse hemorrhage which had taken place into the peritoneal sack. The blood I found, had proceeded from the spleen, which was lacerated in the

direction of its smaller diameter : immediately over the lacerated surface, the blood was coagulated, but the greater portion of that effused into the abdominal cavity, remained in a fluid state. All the viscera of the abdomen, although feebly organized, were free from organic disease or lesion, except the spleen, the size of which was considerably increased beyond its natural dimensions, and the consistence soft and pulpy.

It is of consequence to note, that the deceased resided in the most unhealthy part of Mazagon; the inhabitants of which, composed entirely of the poorer classes, and principally Portuguese, are much affected by intermittent, and remittent fevers.

The son-in-law was convicted of manslaughter, and transported.

2. The second instance of death, occurring from a similar cause, to that observed in the preceding case, happened in the month of September 1836, in the person of a Portuguese cook, who was attached to the 2d Battalion of Artillery. On the morning in which he died, deceased, who was a middle aged man, was observed fighting with a little boy not more than 12 or 14 years of age, and who in stature scarcely reached to the deceased's waist. Shortly after, the fight terminated by the little boy making his escape, and running into the bazar, the deceased became very weak and faint, and complained of uneasiness of the left side : these symptoms increased, and in a few minutes he expired.

On examining the body externally, no mark of injury could be detected. The abdomen was distended, and on making an incision through the parietes, a large ac-

cumulation of fluid blood was observed, filling the cavity of the peritoneum.

The abdominal viscera when examined, proved to be in general healthy ; the spleen alone, being in a diseased state, much enlarged, and so tender that the slightest effort sufficed to push the end of the finger into its substance. This organ presented a linear laceration across the surface, which extended to the depth of half an inch. From the vessels ruptured by this lesion, had proceeded the hemorrhage which proved fatal.

It was stated, that the deceased had previously been subject to fever, and had only recently returned from Socotra, whither he had accompanied a detachment of the troops, that suffered so severely from sickness, on that Island.

It was not clear whether the exertions of the deceased himself, or any blow inflicted by the fist (for the little boy had no stick, or weapon of any kind in his hand) of his adversary, caused the rupture.

The Jury gave a verdict of " death from laceration of the spleen caused by over-exertion."

3. In the month of November 1836, an inquest was held on the body of a native labourer, at a place called Cooly Wadab, Sonapoor, situated in the woods of Girgaum. Respecting the circumstances attending this person's death, I collected the following details, before proceeding to examine the body.

The deceased, for twenty days previous to his death, had suffered severely from intermittent fever. On the day on which the fatal event occurred, he was visited by a man belonging to the same village, who accused him

of having stolen his knife. Deceased denied the charge, on which he was forcibly pulled out of his hut by the other, into the road or lane, where a third person interfered, who also alleged that the knife had been stolen by the deceased. The latter persisted in denying the charge, when he received from one of his accusers, a slap on the cheek, with the open hand; this was followed, by one blow with the fist, but the informant did not see, whether the blow struck the deceased on the chest or the belly, as the back of the deceased, was turned towards the informant.

Upon being struck, deceased went into his house, but immediately returned from his room, into the passage, where he fell on his face: he got up, advanced two or three paces towards the informant, and fell down again on his face. He was then observed to pass his stools and urine involuntarily; he rolled about, asked for water, which was given him, and, after drinking the water, he became motionless, and expired in a few minutes. Deceased was labouring under an accession of fever at the moment he was assaulted.

On examining the body, no injury of the integuments could be detected. The body was considerably emaciated, and exhibited a general sickly appearance; the abdomen was tumid; the cavity of the peritoneum was filled with blood. The liver was larger than natural, soft in texture, and affected with a pale degeneration; the mucous coat of the large intestine exhibited numerous, chronic ulcerations; the whole of the coats of this division of the intestine, particularly near the colon, were thickened; but the spleen, was most of all, diseased, being six times larger than the average size of that organ,

when healthy; itwas soft, but less spongy than when free from disease. On the peritoneal surface of the spleen, an irregular, ragged laceration was detected, which was about four inches in length, and in some parts, nearly an inch in depth.

No other morbid appearance was observed.

4. The last instance, which I shall here submit, of death arising from lacerated, or ruptured spleen, occurred during last monsoon, in the month of August.

The subject was a young man about 21 years of age, of the *Bhoe* caste; he resided within the fort, in a locality unequalled perhaps, by any other in the island, for filth, and various other fruitful elements of insalubrity. The circumstances which led to his death, were related to me as follows.

The deceased had cohabited for two years, with the wife of another man belonging to the same caste. To this disgrace, the latter had passively submitted for some time, but at length, being roused by the representations of a friend, he resolved to punish the paramour. He managed to meet the deceased, near the house of the latter, and commenced an altercation with him, which ended in a scuffle, during which, deceased received one, or more kicks on the belly. After the scuffle was over, deceased was helped to his dwelling, which was an upper room; here he expired in a few minutes, having complained of faintness, thirst, and uneasiness of the abdomen.

The body appeared, very delicately framed; the surface was pale: there were two slight scratches, or superficial excoriations in the left hypochondrium, over the cartilages of the sixth, and seventh ribs. There was a general fluctuating distention of the abdomen, the cavity

of which, when laid open, was found to be filled with fluid blood. The spleen which was lacerated in the same manner, as observed in the foregoing cases, presented also, a similar morbid enlargement.

The other viscera of the abdomen, were entirely free from organic disease. It was stated, that the deceased had suffered from fever, previous to his death.

In concluding this section of my paper, it is scarcely necessary for me to remark, upon the obvious analogy which, in several points, connects the four preceding cases. In all, the subjects had resided in situations which were remarkably unhealthy; in all, the individuals had been subject to intermittent fevers, either at the time of, or shortly previous to, their decease; and in all, that fatal event occurred, between the months of August, and November, that is, at the termination of the moonsoon, the season during which, the native inhabitants of this island, suffer most severely from fever.

The very slight degree of violence, which proved sufficient, in all these cases, to produce the serious lesion of the spleen, cannot fail to be remarked; and this fact will explain instances, of not unfrequent occurrence in this country, wherein death by misadventure, has followed a trifling blow (either accidentally or intentionally) inflicted on the abdomen.

Such cases, I repeat, though not unfrequent, are still obscure, or unexplained, as regards the immediate cause of death, owing to the circumstance, that in them generally, no *post mortem* examination has been instituted.

We know, that this organ is completely protected, by the deep position it occupies, in its normal situation, in the left hypochondrium, resting on the diaphragm,

and placed behind the cartilages of the false ribs. But by the change of position, which accompanies its diseased enlargement, this protection is entirely lost, and its tissue, delicate even in a healthy state, but rendered more frail by morbid alteration, is much exposed to mechanical lesions, such as those above recorded.

CASES OF DEATH FROM LACERATION OF THE LIVER.

1. The body of a boy, who had been run over by the mail cart, was the subject of a coroner's inquest in March 1834. On the right side of the chest, and following the direction of the sixth, and seventh ribs, a linear depressed mark, could be observed, on the integuments. The abdomen was distended, but no other injury could be detected, externally.

The abdomen when laid open, was found to contain, within the sack of the peritoneum, a large quantity of fluid blood. The liver on its convex, or peritoneal surface, was lacerated to the extent of six inches, the laceration penetrating to the depth, of nearly an inch. The other abdominal viscera, and those of the chest were uninjured.

2. In this case, the deceased was found early in the morning, lying dead on the road, and it was conjectured that he had expired during the night, for no account could be collected as to the manner in which he had lost his life.

There were no appearances on the body externally, that could lead to any suspicion, as to the immediate cause of death, except a general distention of the abdomen, in which a distinct fluctuation could be observed.

On laying open the abdomen, it was perceived that a vast collection of blood, had given rise to the swelling. There was observed in the liver, an extensive laceration in the antero-posterior direction, commencing at the margin, and extending towards the posterior part of the organ, and situated nearly on the line of division between the right, and left lobes which were to a certain extent, (4 or 5 inches) separated from each other; the lacerated surface was very irregular.

No other injury could be observed, and the other viscera, both of the abdomen, and chest, were free from lesion, mechanical or morbid. I conjectured that a heavily, laden cart, by passing over the body of the deceased, while he lay in a state of intoxication, on the road, might have produced this injury; but no evidence could be collected to prove, how far this conjecture was founded.

Bombay, November, 1837.

A

LETTER

ON

THE MANNER OF BREEDING LEECHES

PRACTISED IN THE DECCAN,

ADDRESSED TO THE SECRETARY OF THE SOCIETY.

BY

A. GIBSON, ESQ.

Presented November 1836.

I had the honor to receive your letter, under date October 23d, in which you mention that you had heard, that leeches were regularly bred in the neighbourhood of Seroor, for the supply of sundry of the hospitals, as at Poona, Ahmednuggur, Seroor, Bombay, &c.

In pursuance of your request, I immediately set to work, to find out the place where the leeches are bred, and this day, proceeded to Sowla, or Gram Village, about eight miles distant from hence, accompanied by Lieut. Skinner, 2d in command of the Auxiliary Horse.

I am happy to say, that I found the particulars mentioned in your letter, generally verified. The leeches had been taken from their cocoons this morning, and therefore we could not see them, during the actual process of

transition, but we saw the parent leeches; and I have the pleasure to inclose, a parcel of the cocoons from which, the young were taken, and to add, that we saw the young brood, in full activity and life, each leech being in length three quarters of an inch.

The people were very reluctant to show us the process of production, in actual operation, but at length, on promising a reward, and by other persuasive means, we succeeded in inducing them to do so. We were taken into an inner apartment, and a large earthern vessel buried in the earth, and filled with brownish soil, apparently without any admixture, and most carefully covered over, was shown to us. On raising the covering, we perceived, that the leeches had all made their way, to the lower part of the vessel, leaving the upper parts of the earth furrowed, and perforated with their tracks.

The people told us, that the leech, on reaching maturity, is fed on a buffalo, or, if opportunity offers, on a human subject; it is then put into the earthen vessel to breed, but nothing is known of any distinction of sexes.

In this vessel it remained, in hot weather, from one to one and a half months, and in the cold weather from one and a half, to two months. The vessel is then opened, the leeches are taken out, and to each is found attached, the membranous reticulated egg, herewith sent, and this egg contains, from four to six leeches. The young on being taken out, are put into an open earthen vessel filled with brownish earth, and after two months, are said to be fit for use; if not then used on the human subject, they are fed on buffaloes, and afterwards placed to breed.

The people say, that the animal generally lives four,

sometimes five, and rarely six months. They describe this process of production, as being carried on at Sowla, at Bela, at Chap Maroli, at Sungunmair, but to their knowledge, at no other places; and that it is altogether in the hands of a few Musulman Bungias, who are probably relations. It seems not to be general throughout the country.

I need not advert, to the useful purposes to which, this art may be applied, in breeding leeches in those countries where they are scarce, on shipboard, or in England, where they are frequently sold at most exorbitant prices.

I may mention, by the way, that during a vogage I made from Bengal to China in 1823, I had a number of leeches, all of which were used. To the best of my recollection, they were in a bottle with a little water, and a very little earth; one young leech was produced after they had been used. This tends to show that they might be produced on board of ship, with that same ease as on shore.

Permit me to hope that the communication of the above particulars, may not in any way interfere with the legitimate gains of the poor people, who have shown us the process.

Camp Seroor, November 14th, 1836.

Note by the Secretary. The letter to which Mr. Gibson's is a reply, was dictated by information casually obtained from a leech-man.

The practice of breeding leeches as described by Mr. Gibson, is not, there is reason to believe, peculiar to the Deccan; it is practised also in parts of Guzerat.

On a reference to works on this subject, it appears that the manner of reproduction of the leech, is not unknown in Europe; and in some places in France, it is turned to practical account. In a work on the

medicinal leech by Dr. Johnson, of Bristol, published in 1825, there is the translation of a Memoir, read in March 1822, by Mr. Noble, Physician of the Hospital of Versailles. This author appears to have been the first who ascertained that the leech was oviparous. His experiments were made on leeches confined in a reservoir of water, the sides of which were coated with clay; the cocoons were found imbedded in the clay.

The following extract from that Memoir, will show that the practice in some parts of France, is not very unlike that detailed in Mr. Gibson's letter.

"Immediately after the perusal of the above Memoir, M. de Plancy, a member of the Society, remarked, that the existence of the cocoons of the leech had been for a long time known in the department of Finistere. He gave us afterwards to understand, in a Memoir read at the following meeting of the Society, that it was by means of these cocoons the leech dealers in Bretagne, and particularly in Finistere, replenished with leeches the ponds destined to furnish the metropolis with a great part of the leeches, there employed. About the month of April or of May, he informs us, according to the nature of the season, they send out labourers, provided with spades and baskets, to the little muddy marshes, where they are known to exist in abundance. These workmen then set about removing those portions of mud that are known to contain cocoons—such as have been exhibited to you, and which are afterwards deposited in sheets of water, previously prepared for their reception. Here the young leeches are allowed to quit them, but are, after an interval of six months, withdrawn, for the purpose of being conveyed to larger ponds. Horses and cows are then driven in to feed on the margin of these ponds (doubtless with the view of affording the leeches nourishment, and still furthering their growth) and in twelve months from this period, the leech-dealers begin to collect them for medical use.

From experience it would appear that leeches do not multiply in abundance, unless they have previously sucked the blood of animals, particularly that of cows.

I may here just remark, that leeches, deriving in this way an abundant supply of rich nutritive aliment, become stronger and more vigorous, consequently better fitted for reproduction. I may also add, that if the capillary vessels in the skin of cows are more superficial, and the epidermis less tough than in that of horses, leeches may be enabled to obtain, and with greater facility, sustenance more favourable to their nutrition.

These important facts, so strongly confirmatory of those advanced in my own Memoir, were communicated to M. de Plancy by an individual who, among other occupations, has trafficked for the last twenty-five years

in leeches, and who procures them all from Bretagne. Similar facts have also been brought forward by M. Mouton, jun. a leech dealer in Paris, who has for a long period been engaged in this kind of commerce, and who derives all his leeches from the same quarter."

In the first volume of the selections published by the Medical and Physical Society of Calcutta, at page 324, there is an extract from the London Medical Journal, March 1833, detailing the discovery by Mr. Moreau, of Angers, of the manner of preserving leeches in earth instead of water. To this extract there is appended a note by Mr. Twining, descriptive of the manner of preserving leeches followed by the leech-men of Calcutta. As a similar mode is practised on this side of India, I cannot do better than quote that gentleman's description.

"The leech-men employed in the General Hospital, Calcutta, do not keep their store of leeches in water: they use large earthen pans capable of containing about four gallons; the mouths of these pans are nearly a foot in diameter. From 500 to 2000 leeches are put into one pan, with about five pounds weight of the hard mud, or earth collected from the sides of the ponds whence the leeches are procured: the mud is broken into pieces half the size of a nutmeg, and a strong coarse cloth is tied over the mouth of the pan. The leeches constantly crawling among the pieces of earth, are kept clean and healthy. The slime from their bodies makes the earth slightly moist. Once a week the leeches are put into a cloth, and washed for a few minutes in clean water, and then returned to the pan. When kept in this way few die. In the hot, dry weather (April and May), a little water is sprinkled on the leeches once a day. The native leech-men suppose that the leeches breed in the mud. Leeches may be equally well kept if tied *tight* in a bundle, in a strong coarse linen or calico cloth, the bundle being dipped in clean water once a day, and the leeches taken out and washed once a week; but the leech-men do not think they breed, when tied in a cloth, as just now described."

This detail has been entered into, in order to show that the only new points of information, which have been elicited, are that the re-production of the leech, as well as its preservation, is brought about with more facility, and convenience in vessels filled with earth, than in reservoirs of water; and that it is an object to attend, to the state of nutrition of the leech before setting it apart, for purposes of re-production. It has been, further had in view, to call the attention of members of the Society, to the subject, and to suggest the advisability of further enquiry. The process has been described to me in detail; much of which is curious and new, and might with advantage be followed, where leeches are scarce, and expensive; but a report on hearsay of what admits of such easy verification had better be avoided. C. M.

APPENDIX.

No. 1.

Two Cases of Infantile Disease terminating fatally. By A. DUNCAN, *Esq.*

1. *Gastro-enteritis.* The subject of this case, was an infant one month old. I was called on account of its being very restless, and screaming violently in the night; such had been the case, during the greater part of its short life. This was on the Tuesday afternoon, preceding death; his mother had given him three, or four grains of *magnesia*, which was followed by seven, or eight liquid, green motions. Satisfied, that there was much acidity in the primœviæ and unhealthy action of some of the viscera, particularly the liver, I put him on a course of *hydrarg. cum creta* with *magnesia;* on Wednesday the motions were free, and generally of a bright green; on Thursday much the same: on Friday mixed more with yellow, and during this time, the symptoms, although alleviated, did not show any satisfactory amendment. His motions having altered in colour, a dose of *ol. ricini* was given, which brought away, three, or four motions of a rather bright yellow colour, only partly tinged with green, and to ensure him, a more quiet night, *pulv. Ipecac. comp.* was added to the *hydr. cum creta* (and no *magnesia*), and *ol. anisi* (the article of all, that most speedily afforded him throughout, any relief) was allowed, it was given diluted, and with sugar, one to two thirds of a drop, as a dose.

A little after midnight I was sent for; there was no pacifying him, and he refused the breast; the medicine had been given, and he had *magnesia* with *ol. anisi*, but there was no change. I found him in agony, scream followed scream, and when there was an interval, it was occupied by a low moan; the whole abdomen was distended, but chiefly the epigastrium; he could scarcely swallow.

I threw up warm water, three different times with manifest alleviation of the symptoms, put him in a warm bath, and, (thinking the removal of ingesta, or at any rate, of the gas which so painfully distended the stomach, would be productive of relief,) gave him *liquor antimon. tart.* in warm water. He did not vomit, but eructated freely; he was greatly relieved, and became quiet. I left him at five, and saw him again at eight. He was then very torpid, moaned lowly; and died at nine A. M.

Inspection at two P. M. in presence of Mr. Hamilton. Externally the legs, parts of the body, and the arms, were purple; the plump appearance of the living child, had passed away, and the features were greatly collapsed.

There was adhesion of the dorsal aspect of the left lung, to the surrounding parietes, but not of great extent. The heart was small, but healthy. The liver was sound, the gall bladder distended with bile, but the mesentery was intensely red, and the stomach was inflamed, and ulcerated to a full third of its whole extent, and a third of that portion, was denuded of its internal coats. Extensive disease of the same kind, existed also, in the small intestines. Portions varying from three inches in length to a mere speck, were inflamed or ulcerated. In two portions, that I examined, of some length, the external coat alone remained, thin and semi-transparent. Part of these intestines were, on the other hand, quite normal, and the rest of the abdominal viscera were also healthy. The stomach contained much acid, blended with its contents; acid which was pungent, and there was present the odour of incipiently putrid flesh.

2. *Softening of the Brain.* A child three and half months old, was seen on Friday afternoon. He had fever during the day; it was then slight, and of ordinary symptoms; bowels open. I prescribed the usual remedies for fever. The fever returned, or rather having been less, increased by 8 P. M. More medicine was given. At 7 A. M. I saw him. He had a bad night, was drowsy, had not much fever, looked rather heavy for its amount, no strabismus, motions partly green, partly yellow; medicine of a more active nature was prescribed; and, as I had to go to Hurnee on duty, I requested that Dr. Robson might be called in, if the symptoms did not speedily amend. During the day it was thought, the infant was dying. He rallied, fell off again, and died at about eight in the evening,

Inspection eleven hours after, witnessed by Mr. Robson.

On opening the calvaria, considerable fulness of the vessels was manifest; but on raising its contents in my hand, I felt the brain give way, and that it was supported as a mass, only by the tunics. In short, the whole brain, with the exception of the corpus callosum, and part of one lobe of the cerebellum, was in a state of ramollissement; it was like ill made starch, or a more correct idea will be formed, by those who know the article, by considering it (excepting in colour) as like badly boiled *sowans*. It was the most complete case of ramollissement I have as yet seen. I had bent back the skull, without separating it behind, that any fluid might be retained. There was a large quantity, but it was not measured.

The liver was very large, but otherwise normal; the other viscera were also healthy.

Dapoolie, February 1837.

No. 2.

Two Cases of rapidly fatal Cerebral Inflammation, with obscure symptoms, complicated with Croup-like Cough. By J. Murray, Esq.

1. A fat stout child, aged ten months, was carried out on the evening of the 27th April 1837, in his usual health, and on his return home, was found to have a sharp, dry, croup-like cough. Little notice was taken of it, and on the following morning, a dose of castor oil was given. He was seen in the course of the forenoon by Dr. Morehead, and had then, occasional paroxysms of a sharp, shrill cough, with frequent, short, sonorous inspirations, his breathing being easy, and without wheezing, during the intervals. He had no constitutional disorder; bowels freely moved by the castor oil, and motions of natural appearance. No teeth had protruded. Cut down upon the two upper incisor teeth, (the gum of which was slightly tumefied,) and ordered an emetic, which acted slightly. In the evening his cough had become less frequent, and he was free from all febrile symptoms. (Ordered a tepid bath.)

I saw him for the first time, on the forenoon of the 28th. He was reported to have been hot, and restless during the night, but was then tolerably cool, and his skin moist. He was peevish and fretful. Pulse 120. The fits of coughing were slighter, and less frequent than on the previous day, and respiration was natural during the intervals; had several natural motions during the night. (Repeated the emetic.) At five P. M. there was very little cough; breathing rather more frequent than natural, but not deep; no unusual heaving of the chest, and no wheezing on inspiration; there was a peculiar fretful whining; anxiety of countenance, without much restlessness; position of the head in bed quite natural, and quiet; pulse 125; pupils natural; no increased heat of skin, except in a very slight degree on the forehead; motions now of a greenish tinge, though otherwise natural. (6 leeches to the temples; a dose of *calomel and antimonial* powder.)

A good deal of prostration was produced by the leeching. At 8 P. M. the cough had left him; the features had become sharpened; his pulse was 140; and there was constant kicking of the feet, though he was in other respects quiet. Still he swallowed his food most readily, had no appearance of drowsiness, and was quite cognizant of persons around him. One of the upper incisor teeth had protruded a little. Cut down again, upon all the incisors, both of the upper, and lower jaw, and repeated the *calomel* powder. At a little before 11, without any preceding change, he struggled twice or thrice, discharged some flatus from the stomach, and seemed better: in one or two minutes more, respiration, and pulsation had ceased.

Anatomical Inspection eight hours after death. Dr. Morehead present. On dividing the scalp, the anterior fontenelle was found unclosed. The cranial bones were unusually thin, and soft; and both their external, and internal surfaces had an uniform and intensely red tinge. The dura mater, very strongly adherent to the inner table of the skull, more particularly that part of it, attached to the upper portion of the occipital, and parietal bones, with which, it was so intimately incorporated, that it could not be dissected from its attachment. Considerable injection of the minute capillary vessels, and a slight degree of opacity of some portions of the arachnoid, and pia mater, with serous effusion in some places between the two membranes. The whole of the cerebral substance, when cut into, presented numerous bleeding points: the surface of the cineritious substance, when scraped with the handle of the scalpel, was found of a soft pulpy consistence, (though it did not appear so, to the eye) which extended downward, only a few lines from the surface. The lining membrane of the two lateral ventricles; and also of the fourth ventricle, was tinged of an uniform red colour, but had not lost its transparency: and there was an effusion of about a tea-spoonful of bloody serum, into the right lateral, and fourth ventricles. The choroid plexus considerably injected. The sinuses, more particularly the two lateral ones, gorged with dark blood, partly fluid, partly coagulated. There was the same increased vascularity (without opacity) of the membranes and substance of the cerebellum, as has been related of the cerebrum.

The mucous membrane of the larynx, and trachea was of an uniform bright red colour; and the canal nearly clogged up, with a quantity of inspissated, glairy mucus, very slightly adherent to the membrane. The bronchial ramifications, as well as the lungs, quite free from disease. The nerves of the throat, particularly the recurrent branch of the eighth, were examined with great care; but no morbid appearance could be detected, nor any enlargement of the cerebral, or thoracic glands. The abdominal viscera healthy; an immense quantity of subcutaneous fat.

Remarks. It would be difficult to select, from the records of pathology, a case which more strikingly exemplifies the caution, with which we ought to rely, on the descriptions of systematic authors; even in those forms of disease, which are usually supposed to be characterized, by the most strongly marked symptoms. The cerebral inflammation ran its course, with unusual rapidity, and that course, unmarked by any impairment of intelligence, of sensation, or of motion. The peculiar querulous whining, and (for an hour or two before death) the kicking of the feet, constituted, the only two symptoms that could be fixed upon, as indicating cerebral disease. The sudden cessation of cough, when from the vascularity of the larynx, and trachea, and the great quantity of mucus in the canal,

it might have been supposed, that the patient had died from asphyxia, is worthy of note.

The following case resembles the preceding one, in its principal features, though the disease was slower in its progress, and the cerebral symptoms were less obscure. It is to be regretted that the larynx, and trachea were not examined; it being very probable that the cough was originally seated in these organs, (as dissection proved it to have been in the former case,) and that there was a gradual extension of disease to the lungs, there having been no indication of pulmonary disease, at its commencement.

2. A healthy child, aged 16 months, was suddenly seized, on the 27th February 1837, with a croup-like cough, which was attributed to dentition. During the following fortnight he is described as having had, very little pyrexia: but there was a great inclination at times, to lay the head down; pupils slightly dilated; tongue clean; motions pulpy and ill conditioned. (Treatment by purgatives, mercurials, cutting the gums, &c.) On the 12th March, he is stated to have been very weak, and to be more fractious than he had been, a few days previously; the skin a little warmer than natural, and the evacuations mucous. 13th. Great prostration, cellular effusion taking place in the extremities, and motions of natural appearance.

The child arrived at this station on the 16th, and I saw him at 12 o'clock for the first time. He was very fretful and whining, and extremely restless, tossing from side to side in bed, but most frequently with his head reclined upon his arm. Respirations frequent (45 in the minute), deep, and laboured; pulse 160; skin cool; eyes bright, with natural appearance of pupil; nostrils expanded; lips and mouth parched; frequent grinding of the teeth; urine high coloured; no perceptible ædema of the extremities; flesh well preserved. There was no cough, and no change of posture seemed to effect the breathing; but, as has been mentioned, there was an evident preference given, to recline the head downward; he was quite sensible, and took food very readily. He now slept composedly for about two hours, (respiration being much less embarrassed during sleep,) but on awaking, there was the same querulous whining, and an increased degree of restlessness. At 5 o'clock he passed a very healthy-looking motion, after which he brightened up, and for a few minutes seemed better; suddenly he struggled convulsively two or three times; was quiet for a minute, and expired, on the 18th day of the disease.

Anatomical inspection fourteen hours after death The dura mater adhering very firmly, to the inner surface of the cranium. The capillary ramifications of the meningeal vessels, in every part of the brain, most minutely, and vividly injected, without a corresponding vascularity of the larger branches. No morbid thickening, or deposition on the arachnoid, and pia

matter. Various bleeding points observed, on cutting into the medullary substance of the cerebrum, and medulla oblongata; no serosity in the ventricles. Portions of the lower lobes of the right, and left lung of a dark red colour, solid, and in some places almost granular; giving out very little sanguineous fluid when incised, and emitting scarcely any crepitous sound, when rubbed between the fingers. The rest of the lungs sound. A slight degree of vascularity of the bronchial lining membrane. larynx, and trachea not examined The liver apparently more enlarged than is usual, even at this early age. Spleen condensed, and somewhat granular in structure. Other viscera sound.

Malcolm Pait, July 1837.

No. 3.

Poisoning by Bichloride of Mercury. Presented by J. MURRAY, *Esq.*

1. A Hindoo, on the 9th of May 1836, swallowed accidentally a small quantity of a solution of bichloride of mercury, that had been in use for preserving the skins of birds. The quantity taken, could not be exactly ascertained, but was supposed to amount to about six or eight grains. He vomited almost immediately, but did not give intimation to any one of what had occurred. Two days afterwards, he was seized with diarrhæa, which continued only two days; the motions during that time described to have been frequent, liquid, and of black colour, but were not seen. About the same time a slight ptyalism came on, which lasted three or four days. On the 15th he was seen by Dr. Orton, who found him complaining only of debility without any local symptoms. The diarrhæa was stopped, and the ptyalism nearly gone. During the 16th and 17th he had repeated attacks of epistaxis.

On the 18th I saw him for the first time. The bleeding from the nose was then profuse. His pulse was about eighty, and of natural strength. respiration rather slow, and deep-drawn, heat of skin slightly under the natural standard. He had frequent tremors, and twitches of the tendons of the arms. There was no epigastric pain, or tenderness, no vomiting, no abdominal tension, countenance anxious, but in other respects not altered. Jaws were stiff, so that the mouth could be seen with difficulty: but there appeared, very little sponginess of the gums. There was a strong tendency to dozing, but he answered questions intelligibly when roused.

The bleeding from the nose was checked, by the injection of a strong astringent solution. During the 19th, he vomited most of the medicine, and nourishment he took. The lethargy gradually increased; the pulse

fell to sixty, but continued toberably firm; and he expired about 11 o'clock in the morning of the 20th, the twelfth day after taking the poison.

Dr. Orton and Dr. Morehead were present at the dissection.

Anatomical Inspection five hours after death. On opening the abdomen, the external appearance of the contained viscera, was healthy, except the colon, which was of a blueish colour. The stomach was empty. The whole of its mucous membrane was preternaturally thickened, of an intensely red punctiform appearance, and besmeared with an unusual quantity of a viscid adherent mucus, which at first sight, looked very much like lymph. The mucous lining of about one fourth of the duodenum, commencing from its upper extremity, presented the same appearance of morbid vascularity, as that of the stomach. The lower portion of the ileum was injected in a slighter degree. No morbid vascularity of the mesenteric vessels. In the cæcum, and throughout the whole extent of the colon, was found a considerable quantity of a black fluid matter; a small quantity of a similar matter, but of a less deep color, having been contained in the lower part of the ileum. This was at first supposed to be bile; but on spreading a little of it on a piece of white paper, it showed a reddish tinge, rendering it probable, that it was a melanotic secretion ftom the intestinal capillaries. Underneath this matter, the mucous membrane showed no increased vascularity, except two or three patches in the descending colon; but in some parts, it seemed to have imbibed some of the colouring matter of the secretion, which could not be removed by washing. In the cæcum, adhering to its mucous surface, were found four small worms, from one, to two inches in length, thread-like, hooked at one extremity, and tapering and pointed at the other. They probably were the *Trichocephalus Dispar*, or long thread-worm. The gall bladder perfectly empty and collapsed. The kidneys and bladder healthy: the latter containing a good deal of urine.

The right ventricles and auricle of the heart were morbidly soft and flaccid, with atrophy of their parietes.

The brain presented a blanched appearance.

Malcolm Pait, July 1837.

No. 4.

Case of Poisoning by Opium. Presented by C. Morehead, Esq. M. D.

At Malcolm Pait, on the 19th December 1834, at 2 A. M., I was called to see the Karkoon of the station.

It was stated, that after having supped, he went to bed at 10 P. M. and was heard, shortly before I was sent for, to breathe loudly; this induced some one to go into his room. I found him perfectly comatose; breath-

ing occasionally stertorous; pulse sometimes feeble, sometimes of natural strength; pupils contracted; no flushing, nor discoloration of face.

As there was reason to suspect, that poison had been taken, (whilst the stomach pump was being got ready) half a dram of *sulphate of zinc* was given, without effect. The stomach pump was then applied. With the first fluid evacuated, there was some undigested rice. The subsequent injections, and evacuations, which were frequent and copious, consisted only, of the water turbid from the rice, and exhaled no peculiar odour. The pulse became feebler, and a little brandy was injected into the stomach. A blister was applied to the neck, a purgative enema exhibited, and constant shaking enforced; no improvement; died at 8 A. M.

Inspection. Body examined at 11 A. M.; nothing unnatural in the external appearance; countenance not bloated, nor discolored.

The stomach was natural, of rose colour internally, and containing a considerable quantity of rice, little affected by digestion, of light saffron colour, and exhaling a faint alcoholic smell.

Head. No vascularity of integuments. On removing the dura mater, the vessels appeared, considerably congested, and there was effusion of serum underneath the arachnoid. Many granular points attached the layers of the arachnoid, to each other, where the dura mater dips down between the hemispheres, to form the falx. On incising the brain, bloody points appeared. There was no fluid in the ventricles.

Chemical Analysis. The washings of the rice contained in the stomach, were submitted to the process of analysis, recommended by Christison, at page 607 of the second edition of his treatise on Poisons. They consisted, of five ounces and a half of amber coloured fluid, which was evaporated, and left a dark coloured residue, of the consistency of syrup; to this, ten drachms of alcohol were added, which caused a brown coloured solution, with a considerable quantity of insoluble, tenacious, adhesive, olive brown residue, without bitter taste. After ebullition, and cooling, the alcholic solution was filtered, and was then of dark amber, brownish colour, seven drachms in quantity, and of slightly bitter taste. This was evaporated to the consistence of a thin syrup of dark colour, which was dissolved in two ounces of rose-water.

Being unpractised in chemical analysis, I was unwilling to conduct the process further. I accordingly sent the above solution, in a sealed phial to Mr. Heddle, and the following is his account of the remaining steps and the result of the analysis.

"Taking up the process where you left off, I first added to the fluid contained in the phial marked No. 2, a solution of *acetate of lead*, which caused a brownish light precipitate; the fluid was filtered after the whole of the precipitate was thrown down; and secondly, through the filtered fluid I passed a stream of *sulphuretted hydrogen*, which produced a copi-

ous black precipitate. This having subsided, the supernatant liquor was filtered, and evaporated on a water bath, till reduced to one half of its original bulk; thirdly, to a portion of this fluid I added a few drops of strong *nitric acid*, which caused neither precipitate, nor any change of colour; *liquor ammoniæ* was added to the remainder, and a dense white curdled precipitate was thrown down. This precipitate was well washed on a filter, and treated with the strongest alcohol I could procure, the alcoholic solution was then evaporated on a water bath, till a thin crystalline crust, or film, remained on the dish; when a drop of strong *nitric acid* was placed on the surface of this crust, a pale red colour was produced, similar to that caused by dropping the nitric acid on morphia, with this difference, that in the latter the colour was more intense. In both experiments (which were performed at the same time for comparison) the colour became identical, after the interval of a few seconds. On treating another portion of the residuum with distilled water, and adding to the substance thus suspended a few drops of *tincture of muriate of iron*, a distinct greenish blue solution was formed, exactly resembling that produced, by adding the same tincture to morphia suspended in water.

"The result exceeded my expectation, for the small quantity of morphia contained in our opium, renders this test more apt to fail than in the case of Turkey opium, which contains always one half, often two-thirds, more morphia, than we find in our drug. If we had as delicate a test for narcotine as for morphia, the difficulty of deciding in cases of poisoning by Malwa, or other East India opium, would be much less, as this principle, as you know, exceeds the morphia considerably. in the opium of this country. The muriate of iron test is, I think, worthy of confidence, even when the quantity of morphia is too small, to be detected by nitric acid.

"I did not attempt to detect the meconic acid as the quantity must have been small, and the other test so satisfactory, that it would not have repaid the trouble, even had I succeeded, which I doubt."

No. 5.

One Case of Vascular Sarcoma, and one of Femoral Aneurism. By C. F. COLLIER, *Assistant Surgeon.*

Vascular Sarcoma. Ramboo Khunban, a Cooly woman, about thirty-five years of age, was admitted into the civil hospital at Ahmedahad, on the 19th of April last.

The whole of the right breast and adjacent muscles were the seat of an enormous tumour, of that kind denominated, by the late Mr. Abernethy, *Vascular Sarcoma.*

The superficial veins had become large, varicose, and numerous. At

many points of the tumour, the distended integument had ulcerated, and exposed some very foul, and offensive sloughs, while the surface beneath them, was irritable, and subject to hemorrhage. The tumour, though not very painful to the touch, gave the patient severe, lancinating pains, and its fætor and weight had become most distressing. The woman was emaciated to the last degree, and most anxious for the operation.

On the 3d of May, I proceeded in the presence of Messrs. Gray, and Mackell, to remove the tumour. A stick was passed between the elbows of the patient, and the back of a chair. I requested the medical officers present, to be careful in placing their fingers, upon the principal veins, and below the incision. I first divided the integuments from the axilla to the sternum; from the size of the sarcoma, the incision was very extensive. I then cautiously detached the tumour from the surrounding parts, until I reached the middle of its base, where two elongations of it, extended between the ribs, and superior origins of the serratus magnus. This circumstance, more especially as I felt, arteries strongly pulsating beneath, caused a somewhat formidable dissection; I performed it very cautiously with the handle of the scalpel, and my finger, and succeeded in perfectly detaching the adhesions. The weight of the tumour, afterwards rendered the process easy, and a few strokes of the scalpel, finished it. The operation rather exceeded five minutes, and the loss of blood was judged to have been about a pint. Only three arteries were tied, one during the operation. Strips of adhesive plaster were applied over the wound, and though, from the diseased state of the skin, I could scarcely spare enough to cover the wound, it was comparatively very small.

The operation proved successful, and the patient was discharged well, six weeks afterwards.

Observations. The tumour weighed ten pounds, ten ounces; and though I have heard of many large adipose tumours being removed, I scarcely know an instance on record, of a vascular sarcoma of this size, having been operated upon successfully, excepting in the case of a Mr. Goaldy.

I attribute much of the success, to the careful pressure made on the veins, which was only continued a few instants on each, as they were divided, when their retraction rendered it unnecessary; I had not to combat those fearful hemorrhages, so often perplexing to the operator, and fatal to the patient.

A careful examination of the tumour, proved it to have been completely eradicated. The glands of the mamma were all greatly enlarged, as also several glands near the axilla. A tough gelatinous substance seemed to compose the rest of the tumour. A number of blood vessels had grown through, almost every part of this subtance, and those parts where sloughing had begun, had assumed a very malignant appearance, with a structure not unlike to that, described by Sir Everard Home as *cancrum globosum*.

2. *Femoral Aneurism.* Baijee Rajpoot æt. 25, of a robust constitution, admitted into the Civil Hospital at Ahmedabad on the 31st April; discharged on the 29th of May 1837.

About two months previously to admission into hospital, while carrying a heavy weight some considerable distance, the patient felt something give way in his thigh, and from the pain, and swelling, reached his home with difficulty. He deemed the tumour an abscess, and applied fomentations and poultices; but, alarmed by the violent pulsation, and, to him, unusual symptoms, he applied for relief at the Civil Hospital, of which I was in temporary charge. Some days elapsed before he could be made to understand, the extent of his danger, and consent to an operation, which should not have been delayed a moment.

I performed the operation on the 10th of May, in presence of two medical friends. The aneurism had raised considerably, the *vastus internus*, and on one side, the integuments were tense, had a conical prominence, and were livid. The pulsation in the tumour was violent, and every symptom suggested the urgency of the operation. The aneurism, from its extent had pushed the *sartorius* above its usual position, and I therefore, made the incision upon the artery, a full inch above the usual place; but even then found the muscles very inconvenient. I had observed that the artery did not perceptibly pulsate, but as this might depend on its being deeply seated, I laid open the fascia, and cellular tissue, and still no pulsation indicated the situation of the artery, which I was obliged to bring into view, by trusting to anatomy. It was then tied firmly, and all pulsation in the sack ceased instantly; the wound healed by the first intention, and the tumour rapidly subsided. The man was discharged convalescent on the 29th of the month.

The femoral artery where it was tied, appeared to me thickened and enlarged. Whether from distention, its muscular coat had lost the power of contracting on the blood, or from whatever cause, the pulsation in the sack, and its absence in the artery, is worthy of record.

Ahmedabad, May, 1837.

No. 6.

Case of Spontaneous Evolution or Doubling, which occurred after an Arm, Presentation. By T. WALLER, *Esq.*

During the time I was doing duty, with the 6th Regiment N. I., in Surat, I was one day called on, to attend the wife of a sipahi of the regiment, who, it was stated, required the assistance of a surgeon; the native

midwife, who had been with her, having given up the case, as beyond her knowledge.

On strict enquiry, I found that the patient had been attacked with labour pains, early in the morning; that on the membranes bursting, a quantity of bloody fluid escaped, and at the same time the *fore-arm*, and a part of the *funis*, passed the os externum; the latter, although it may appear extraordinary, was, I have no doubt, the case, as the midwife's statement was clear, and explicit, and the state in which I found the parts, on visiting the woman, at about 2 P. M., appeared to strengthen the statement; her condition was then as follows.

The *fore-arm*, and a few inches of the *funis*, protruded from the external orifice; the parts of generation tolerably lax, and moist; the arm itself swollen, the fingers clenched, and stiff, no pulsation of the radial artery, or funis perceptible; the pulse of the female, good; slight pains at times, but little bearing down, the bladder undistended; mind, as might be supposed, anxious.

Thinking it better, at once to ascertain, as far as practicable, the state of the *os uteri*, and general position of the *fœtus;* preparatory to such an examination, I administered an *enema* of *oleum ricini*, and conjee with the view of unloading the rectum; and also administered an anodyne of tincture of opium one dram, mist. camph. one ounce, after waiting about half an hour, during which period the bowels were affected; and having lubricated the hand, and arm, with oil, I proceeded to examine. The child's arm so accurately filled the vagina, that it was only, by extending the fingers, and as it were encircling the arm, that I could succeed in passing the hand into the vagina, and even then with risk of laceration; at this time, the arm of the child could neither be moved upwards, or downwards; I at length, after cautiously moving the fingers, and hand, succeeded in reaching, what I at the time conceived to be the vertex, and found the arm most firmly compressed by it; as also the cord, which did not pulsate; both were *immoveable*, and the introduction of the hand into the *uterus*, was impossible, without exerting a degree of force incompatible with the safety of the patient. Finding this to be the case, I withdrew my hand, and with it, escaped some clots of blood; deeming turning impossible, the question now was, how the child was to be extracted; taking into consideration the fact, that the labour had only commenced in the morning, and that as yet, no bad symptom had appeared in the mother, I consulted with Mr. Assistant Surgeon Don, who, as well as myself, thought it better, to wait a short period, and see what the efforts of nature might effect. On again visiting my patient in the evening (with Dr. Don), we found labour pains had again set in, and that the arm had advanced, further from the outlet; the parts being cool, moist, and lax.

During the short stay we made, each successive pain, which was not violent, succeeded in forcing the arm, and shoulder still further down; at length the *hip*, and part of the *breech* presented; the arm still protruding, and having retracted little, or nothing; (from the position of the parts the child must have been doubled on itself;) at last by a steady, lengthened pain, the breech, and upper part of the thighs were protruded; the legs readily followed, and after two or three minutes, the arms, and head, came as readily, and easily away; the *placenta* soon followed, after the birth of which, a slight gush of blood ensued, which almost immediately ceased: the child was cold, and had been apparently dead some time; the woman recovered without a bad symptom; in one of her previous confinements, the midwife told me, that the hand and head, had been born together; she had in both instances gone her full term.

Gooch has observed, that although the arm, and breech are presenting at the same time, yet, as the latter still advances, until the thighs pass the outlet; the arm *does not*, as would be supposed retract much; Dr. Blundell in his Lectures, relates some instances, in which after arm presentations, by the mere doubling above related, the children were born, much to the surprise of the accoucheurs.

This case seems to me, to strengthen the opinion of those authors quoted in Burn's and Denman's, who refer the efforts of nature, to a *doubling* and not an *evolution*, strictly speaking.

Rutnagherry, June, 1837.

No. 7.

Urethral Obstruction by a Calculus, in a child of three years of age. By A. Duncan, Esq.

The following case seems to me rather interesting, although in point of severity not much.

A pensioned subedar consulted me one morning, about his son, of about three years of age. He had laboured under complete retention of urine, from the previous afternoon. The symptoms were as usual in such cases; there was no appearance of morbid affection of the penis.

Under the impression that the smallest catheter I possessed, was too large for the purpose, I introduced a common probe (the blunt end) into the urethra, and encountered a calculus, about three quarters of an inch from the bladder. I slipped the probe past, by its side, and immediately the urine began to flow high-coloured, and pungently hot. I was able to withdraw the resisting body, perhaps a full quarter of an inch, on the shoulder of the probe, but did not deem it advisable to use

any means, that could produce irritation. Not being satisfied that the bladder was completely emptied, I re-introduced the probe; and further, there being still heat, and tension in the hypogastrium, I tried a catheter, and easily slipped it into the bladder which I found quite emptied.

I explained the nature of the case to the father, and desired that he should watch the boy, and take requisite means to secure the pebble, when it should be expelled with the urine, to increase the flow of which, a solution of *Sulph. Magnes.* with *Spirit Ether Nitros.* was directed to be given, every other hour. Next morning he brought me the accompanying calculus,* which the child had passed rather late in the preceding evening; he reported him as quite well.

I transmit herewith the calculus as it seems to me a large one, to have found its way into so young an urethra, and yet it admitted of a probe being passed by it, and also a small catheter, with scarcely any pain to the child.

Dapoolie, October, 1836.

No. 8.

Observations on the use of "Meeta Tale," or the oil of the Sesamum Orientale, in healing wounds. By A. BURN, M. D.

The plant from which this oil is obtained, first claims attention; it is the common *Sesamum Orientale*, and is cultivated in large quantities, all over India, on account of the seed from which, oil is extracted.

The chief use of the oil is, as an article of food. Without either oil or ghee, the high caste Hindoo would starve. Indeed the use of oil, seems to me, to enter more largely into the food of the natives of this country, at least of Guzerat, than is generally supposed. Here the oil is preserved underground, in large tanks, or buildings of brick and lime, the size of which may be imagined, when I mention, that lately, I saw two men drowned by falling into one of them. In every town the *tale* or oilman is a well known individual, he piques himself rather on the quantity, than the quality of his oil, and it is of consequence to be aware of this, as for all surgical uses, the oil should be fresh, and free from rancidity.

It was in the year 1832, that I first learned the utility of the oil-dressing. One morning in the middle of the hot season, I was requested, to visit a young woman, who had been severely wounded during the night by her husband. He was a chumar, and in a fit of jealousy, had attempted to take

* *Note by the Secretary.* The calculus is apparently of uric acid: weighs two grains, and is of the size, and shape of a middle sized orange seed. C. M.

the life of his wife, with one of those halfmoon-shaped instruments used in cutting leather. The wounds were numerous, and severe on the head, chest, hands and arms, the radial artery of the right arm was divided a little way above the wrist, and the radius fractured at the same place. She had bled profusely, and was quite exhausted from the hæmorrhage. It seemed from the numerous cuts, that he had, after overpowering her, used the instrument in the way of a chopping knife. I removed the hand a little above the fracture, put a few stitches into the largest wounds, and dressed the whole with cloths moistened in the "*meeta tale.*"

The great heat of the season, was one chief inducement at the time, to this practice, for with no other sort of dressing could the discharge, from such numerous wounds, have been changed, with sufficient ease and frequency; two points of the utmost import, considering the weakened state of my patient, and the heat, and dryness of the atmosphere; the thermometer in her hut, rose daily far above (100°). These oil dressings with bandages, and cloths wet with cold water, over them, also a wash of brandy and water occasionally, were the only applications required; and she made a speedy and most satisfactory recovery.

Since the above case, I have had many opportunities of proving the efficacy of this mode of treatment in the healing of larger wounds. In my Hospital nothing is now used but a pledget of common country cloth dipped in the pure oil, to every wound and to almost all ulcers. As a simple dressing, I think it superior to every other, during the hot season of the year particularly. Under it wounds heal more quickly and kindly.

How it happened that the use of oils, came to be discontinued from surgical practice, it is not my object here to inquire, neither as regards their various application; my intention being merely, to bring to notice, the utility of a particular oil, as a means of cure, such as in my own experience I have found it to be. This must account for the brief manner in which I have treated the subject, but, before concluding, I cannot help noticing, that a practice most similar to what is here recommended, has been long since in use; this we incidentally learn, from the parable of the good Samaritan. We are informed, that he, on seeing the wounded man, "*went to him and bound up his wounds, pouring in oil and wine.*" It would be also foreign to my purpose, here to notice, the numerous uses to which this oil is applied in the arts, or to urge the advantages which would accrue, by adding this article to the list of Indian Exports.

Kaira, Dec. 6th, 1836.

No. 9.

Disease produced by the Anacardium Orientale, or Marking Nut. By A. Gibson, Esq.

Permit me to bring to the notice of the Society, a curious case of disease arising from the absorption of the juice of the *Anacardium Orientale* or, marking nut. The publication of the case may not be useless, inasmuch as it frequently happens, that people manipulate the nut for domestic, or medicinal purposes ; and it may be well to show, that this cannot always be done, with impunity.

A servant of mine, on account of a sprain of his thumb, applied the juice of the nut. No untoward effects succeeded the first application, and on the following evening, the juice was applied to the hand (the left) ; next day great swelling, with watery vesicles, surrounded by, and based on extensive patches of reddened skin, appeared on the left fore-arm, left side of the face, and on the genitals ; the inflammation spread over the lip, and *ala nasi* of the same side to the eye, which was closed up, and secreted from the surface of the conjunctiva thick, ropy mucus.

On the second day, the symptoms were increased, the watery vesicles large, and the diffused cutaneous inflammation more extensive. On the third day the eruption, and redness had extended over the whole forepart of the body; the genitals were like a round mass, from diffused swelling, and the right side of the face was considerably affected, particularly about the *ala nasi* and lip. On the fouth day the disease was on the decline, the redness and swelling diminished, the serous vesication changed into a purulent looking mass, and scabs formed in extensive patches. On the fifth day improvement continued. Throughout the disease there was considerable, constitutional disturbance, as evinced by the headache, and loaded tongue; but the pulse, though strong, did not exceed 100. The means of cure I had recourse to, consisted merely, in administering alternate doses of *magnesiæ sulphas*, and *ipicacuhana*. I do not think that these means had the least effect, on the march of the symptoms.

The natives say, that similar symptoms by no means unfrequently occur, from the incautious application of the juice of the *anacardium nut*, and I think I remember to have read, either in an Edinburgh, or a Calcutta periodical, of a train of symptoms very similar to the above, having occurred to a person who broke a bottle of wood oil, (*Dipterocarpus alata* and *pilosa*. Roxb.) and spilt the contents over the arm.

One thing, I think, may be learned from the case, viz. that there is probably good foundation, for the idea entertained by the Hindoo physicians of the very active properties of this juice, when qualified by admixture with other medicines, in counteracting the effects of the venereal poison.

I am led to this belief, from the apparent tendency of the substance to affect the system, rather by means of the external than the internal organs. I recommend the formula as given by AINSLIE to the attention of the curious.

Take of the juice of the nut,
Garlic juice, each *one ounce*,
Juice of tamarind leaves,
Cocoanut oil and sugar, each *two ounces*,

Mix and boil for a few minutes. Of this a table spoonful is given twice a day.*

Ahmednuggur, 16*th Sept.* 1836.

No. 10.

On the Unhealthiness of some parts of Candeish, at certain seasons. Presented by T. WILLIAMSON, Esq. Revenue Commissioner.

During a tour which Mr. Williamson made, in May, and June 1836, of that part of Candeish termed the Bauglan talooka, frequent representations were made to him, of the great suffering of the inhabitants, at

* *Note by the Secretary.* I find in my note book, the following remarks, which may be viewed in connection wtth Mr. Gibson's case.

" *May* 1831. Before dismissing the subject altogether, I shall note a few other diseases of interest, which I saw at Belgaum in H. M. 40th Regiment during the last monsoon.

Many men were admitted affected with an erythematic œdema; it principally affected the face, and penis; the former was swelled so much, that the eyes were in general closed. The disease was unattended with pain, and most frequently without excitement, and yielded readily under the use of purgatives, warm fomentations, or saturnine applications. In one case, in which, in consequence of the swelling, there was complete phymosis; gangrene, and sloughing of the prepuce resulted. This was owing to inattention to cleanliness; the urine diverted from its course, passed behind the swollen prepuce, and lodged there.

Some of the men attributed this affection, to the application to the parts of the juice of an acrid nut, with which they were in the habit of marking their linen. I do not know, that there was any foundation for the supposition; there were certainly many cases, which, could not be attributed to any such cause. The swelling of the penis was often very great, and apt to excite alarm in those, who had not seen the tractability of the disease."

There is every probability, that the opinion expressed by the soldiers themselves, was correct: it is one, however, which I did not share at the time, and it is clear from the above remarks, which I have extracted *verbatim*, that the subject was not properly inquired into.

29*th September*, 1836. C. M.

certain seasons, from intermittent fever. The severity of the type was sufficiently evinced by the emaciated and diseased appearance of many of the inhabitants of the different villages. The disease prevails throughout the whole of the western part of Candeish; but the most unhealthy tract, is described, as bounded on the north by the Taptee, on the west by the Daung, on the east by a irregular line passing through Nundoorbar, Balmeer, and Laonere, and on the south by the Ghauts which divide Candeish from the Deccan.

Nowapoor, Dhywell, Mooleir, Baze, and Byroo, are considered by the people of the country as particularly unhealthy.

Mr. Williamson, when encamped in the neighbourhood of the village of Baze, requested Mr. C. Anding, a very intelligent Assistant Apothecary, attached to his establishment, to make some enquiries relative to the endemic of the village. The information thus acquired, Mr. Anding embodied in a letter, addressed to the Revenue Commissioner, and of which the following is a summary.

The village of Baze, situated on an eminence on the southern bank of the Geerna, is surrounded by numerous nullahs and water, courses; the latter for irrigating extensive fields of rice and sugar-cane. In addition to these sources of profuse vegetation, abundance of vegetable matter, brought down by the river freshes during the monsoon, is deposited on the low grounds adjoining the river.

Fever begins to prevail on the cessation of the rains, and continues till February, and March, when it generally ceases.

The disease is said, chiefly to affect the agricultural classes, the nature of whose occupation exposes them, more than others, to miasmatous exhalations from the water-courses, and rice fields. The type of the fever, in its most aggravated form, is described as a severe quotidian at the commencement: each recurring paroxysm becoming more severe, and longer than the one which preceded, and assuming about the fourth paroxysm, a continued form, attended with *subsultus tendinum* and terminating fatally, with symptoms of cerebral congestion. In the less aggravated forms, the disease maintains its intermittent character, is of the quotidian, or tertian type, and very generally succeeded by enlargement of the spleen, diarrhæa, and anasarca.

The population of Baze is computed at 1000, of whom, in ordinary seasons 150 suffer from fever, and the deaths are reckoned at 25 annually. During the past year the cases of fever amounted to 400, and the deaths to 37.

The treatment followed by the natives (there being no Weid in the village) is to take of Decamalee, Ajwan, and Creat, of each about two drachms, and a half, to rub them together, and infuse in eight ounces of water: this, when sufficiently cooled, is given to the patient in the morning.

Some say, that it is given without reference to a particular stage of the paroxysm, while others say, that the accession of the cold stage is watched, and then the medicine administered.* The exhibition of this remedy is not begun before the third day, and is repeated for three or four mornings, and then abandoned: it frequently induces vomiting.

When the fever assumes a continued form, and symptoms of cerebral congestion come on, then cupping on the nape of the neck (the mode of doing which is minutely detailed) is sometimes had recourse to, followed, if unsuccessful, by the application of the actual cautery to the same situation.

No. 11.

Case of Ephidrosis Partialis. By A. DUNCAN, *Esq.*

A man was brought as a recruit, to the 25th Regiment Native Infantry, from the warlike little territory of Sawunt Warree. It was found that on the slightest exertion, moisture oozed profusely, from his hands, and feet. The case seemed curious, and I requested to see him. He was a stout, able bodied, healthy-looking man, such as it would be desirous to have an army composed of. The word *attention* being given, forthwith, on clasping his hands, and that not very forcibly, the perspiration poured, rather them dropped, from them; the ground was also bedewed around the edges of his feet, and on his changing his place, there were his foot prints, in thorough wet. Being on a cowdung floor, and desired to step about, every step was imprinted wet. His body remained unaffected.

He stated, that he had been all his life subject to this affection; that he was able to work like his neighbours, but got fatigued rather soon; that the various excretions, so far as he knew, were the same in quantity and

* The Committee is indebted to Dr. Lush for the following note.

"The Decamalee Gum resin excudes from the points of the branches of the *Gardenia gummifera* and *Gardenia lucida* of Roxburgh. The latter species is the one growing in the Dapooree garden. It is a common drug in the bazaars of the Deccan as a vermifuge. Six grains are given in the morning to a child of 3 or 4 years of age in *tak*, or whey. In severe attacks or flatus from weakness of the stomach after fever, four or five grains are sometimes given, wrapped up in the betel-leaf, to chew. When diffused through water, the Decamalee is applied to wounds of cattle, to keep off flies.

Ajwan. The seed of the *Ligusticum ajwan* may be considered to have similar virtues, to its analogue in Europe, the dill or *Anethum graveolens.*

"The Creat sold in the bazars of the Deccan is the *Justicia paniculata* of Roxburgh Fl. Ind. vol. I, and not the *Gentian Cherayta* of that author, quoted by Dr. Whitelaw Anislie, *Materia Med.* vol. II, p. 373."

kind as those of others; that his appetite was similar also. In short, from the accounts I had, I could discover no difference, between his usual state of health, and that of others of good habit, excepting this singular flow of clear perspiration from the palms of his hands, his fingers, and feet.

I had no opportunity of watching the man, to know, if all he said as to his habit of body was entirely accurate; he was evidently unfit for military service, as the grasping of a musket, brought the sweat streaming from his hands.

No. 12.

Case of Necrosis of the left Radius. By J. P. MALCOLMSON, *Esq.*

This case occurred in a ryot, from the neighbourhood of Moodul, who was admitted into the hospital at Kulludghee, 27th May 1836.

The left fore-arm was increased in size, the power of rotation was completely lost, that of flexion and extension partially so. There were several openings over the radius, from the bend of the arm to the wrist, which gave issue to a thin, fetid, purulent discharge. The bone was felt bare and rough, and on laying open some of the sinuses, the radius was discovered to be diseased throughout its whole length. The disease was said to be upwards of two years standing, but further information regarding its origin, or progress, could not be obtained. The patient's general health had suffered much. Amputation was recommended, and performed by the flap operation at a short distance above the elbow joint, was and followed by a good recovery.

On examining the amputated arm, the soft parts were found much thickened from the copious deposition of coagulable lymph. The radius was much thickened from the formation of a new osseous shell, with irregular projecting spiculæ, pointing downwards in the direction of the lower extremity of the bone. There were six cylindrical openings in the bony shell, leading to a large *sequestrum*, of nearly the whole length of the radius, of a white colour, completely detached, but, from its size, incapable of escape by any of the openings in the newly formed shell.

No. 13.

Case of Sloughing and Discharge of 25 *inches of large Intestine in Dysentery. By R.* BROWN, *M. D.*

This case occurred in Farrier C. McDonough, 3d Troop Horse Artillery, who was discharged from hospital, cured of fever, on the 17th November 1834. He returned to his duty, but was re-admitted into hos-

pital on the 30th November: stated that for a day or two previously he had experienced frequent feverish feelings, a dull pain, with sense of twisting in the region of the abdomen, and attended by constipation.

On admission he had almost constant calls to stool. The evacuations were scanty, very offensive, and passed with much straining. The abdomen was slightly tumid; there was general tenderness, on pressure more felt however, on the left side: his countenance was extremely anxious and pallid: tongue slightly furred at the root, and centre, with raw and reddish-edges: frequent irritability of stomach: pulse soft, and rather quick: surface nearly natural, dejections thin, of a reddish colour, and extremely offensive.

With more or less of these symptoms he continued till 20th December, when, while straining at stool, there came away *per anum*, a tubular, membranous substance of about 25 inches in length: on examination this proved to be a portion of large intestine, which retained its natural calibre, but the walls of which were much thickened: on dissection the three coats could readily be separated: the fatty appendices, and the three longitudinal fibrous bands, were distinctly visible.

After the separation of this portion of intestine, the evacuations, though still dysenteric, were passed without straining, and often involuntarily; gradually, however, they became less frequent, and the power of retention returned. The nausea and retching ceased, but the least increase of diet never failed to be prejudicial. Bread and milk was that which suited best, and its use was continued till January 18th, when the appetite having become very keen, and the patient importunate for a change, chicken was allowed; much irritation resulted, and, though the former diet was resorted to, the patient continued very restless and uneasy, but without any other symptoms, till within about an hour of his death on the 20th January, when excruciating pain of the lower part of the abdomen was complained. of.

Inspection. It is much to be regretted that Dr. Brown has lost the minute notes which he took of the appearances on dissection. The following statement is made from notes supplied by Mr. Bowstead, from recollection of the dissection, at which he assisted: their accuracy is confirmed by Dr. Brown.

The small intestines were so knotted together by adhesions that they could not be traced. The large intestines were much shortened, and not a vestige of the sigmoid flexure existed. There were morbid adhesions at the posterior part of the bladder, the lower portion of the rectum was much increased in capacity, and seemed to have been formed into a place of lodgment, where, in all probability, the intussuscepted bowel had for some time rested.

No. 14.

4. *An Extract from Dr. Inglis' Report of the Diseases of the 22d Regiment Native Infantry, for the* 1*st half year of* 1836.

The regiment after, a residence of some years in Guzerat, marched from that province to Belgaum in the month of December 1835.

It is stated, that during the sojourn of the regiment in Guzerat, and during its march thence to Belgaum, fevers were the prevailing disease; that since the arrival of the regiment at Belgaum, fevers, though diminished in frequency, had assumed a more violent and fatal character; in many instances being of the true remittent type, often accompanied by violent inflammation of some of the thoracic or abdominal viscera. Dr. Inglis then alludes to an obscure and fatal form of fever, of which he had seen several cases, and which he thus describes—"A characteristic symptom of this kind of fever, and which I have ever found a most dangerous one, is an universal shaking, or trembling of the whole body and limbs; the patient being also unable to keep his tongue steady when projected from the mouth. It is not *subsultus tendinum*, nor the shaking caused by debility, for it displays itself from the commencement of the disease, but one peculiar in itself, arising apparently from the violent shock to the nervous system. It is accompanied by a remarkably rapid, throbbing pulse, and a white and furred, though not loaded, tongue. The skin remains constantly dry and harsh, and somewhat, though very little, above the natural standard of heat; but there is a dulness and stupid appearance of the countenance, and a diminution and confusion of the intellectual powers, rendering it difficult to obtain distinct answers to questions; whilst the patient will not acknowledge that any thing is the matter with him, (with the exception, perhaps, of a little giddiness,) although evidently labouring under a most severe and dangerous malady. Even when an accession of fever takes place, a circumstance pretty frequent during the disease, though never very severe, the patient seems not aware of its existence at the time, and always insists afterwards that he had no paroxysm of fever. In a case lately deceased, the pupils were at one time dilated, but obedient to the light, whilst in another they were not at all affected during the whole course of the disease."

In regard to the treatment, Dr. Inglis is of opinion, that venesection is badly borne, and that moderate purging, the exhibition of calomel and antimonial powder, not however to the extent of affecting the system, small doses of tartar emetic, with camphor mixture, opiates, blisters to the head and neck, afford the best chance of success.

Stimulants towards the termination have not been fully tried from the rapid and often sudden manner in which the disease terminates, precluding the opportunity.

No. 15.

PRESENTED BY THE MEDICAL BOARD OF MADRAS.

General Abstracts of the Returns of Sick of the European Troops belonging to the Presidency of Fort St. George, for the years 1827, 1828, 1829, *and* 1830.

		Diseases.																											
										Fever.							Inflammation of Viscera.												
		Apoplexy.	Asthma.	Cholera.	Colic.	Diarrhœa.	Dropsy.	Dysentery.	Dysury.	Ephemeral.	Continued.	Intermittent.	Remittent.	Hepatic Diseases.	Inflammation External.	Abdominal.	Cephalic.	Thoracic.	Insanity.	Ophthalmy.	Rheumatism.	Scrophula.	Syphilis, &c.	Tumours.	Ulcers.	Wounds and Accidents.	Other complaints.	Total.
1827.																													
Average numerical strength 11,712.	Remained 31st Dec. 1826...	0	3	4	1	8	11	241	0	0	40	215	74	95	0	9	5	26	2	66	78	2	116	0	67	61	127	1251
	Admitted during 1827	16	48	270	388	981	90	3632	16	0	1342	1973	2059	1687	394	281	161	484	32	1082	1078	26	1415	61	1620	1526	3414	24070
	Discharged	4	42	163	377	930	79	3343	14	0	1296	2084	1994	1558	371	267	154	460	29	1028	1038	28	1416	48	1606	1509	3386	23224
	Died	12	5	110	3	25	15	329	1	0	28	28	75	87	0	11	5	26	1	0	17	0	4	1	4	4	45	836
1828.																													
Average numerical strength 12,171.	Remained 31st Dec. 1827 ..	0	4	1	9	34	7	201	1	0	58	76	64	137	23	13	7	24	4	120	101	0	111	12	77	72	105	1261
	Admitted during 1828	24	36	434	455	794	55	2908	13	0	1622	1560	1171	1640	978	245	147	513	13	1063	1220	22	1574	222	1138	1838	2819	22504
	Discharged	11	36	317	456	778	50	2791	14	0	1598	1558	1156	1583	940	230	143	496	14	1123	1238	18	1563	228	1146	1819	2774	22080
	Died	12	4	117	2	20	8	198	0	0	26	22	38	76	3	14	4	23	0	2	13	0	4	1	8	8	48	651
1829.																													
Average numerical strength 11,748.	Remained 31st Dec. 1828 ..	1	0	1	6	35	4	117	1	0	54	56	40	114	59	14	6	16	3	71	69	3	116	7	60	77	93	1023
	Admitted during 1829	18	43	231	287	823	61	2006	13	0	1458	1245	779	1347	1012	272	136	497	32	1313	1140	22	1345	210	910	1733	3031	19964
	Discharged	10	36	202	289	837	54	1901	14	0	1457	1257	781	1332	1023	269	137	473	27	1315	1128	24	1362	205	918	1731	2956	19738
	Died	9	7	30	1	6	8	141	0	0	17	12	20	61	3	6	2	17	3	1	9	0	7	0	1	6	46	413
1830.										*																			
Average numerical strength 11,650.	Remained 31st Dec. 1829 ...	0	0	0	3	15	3	81	0	0	38	32	18	70	46	11	3	23	5	68	72	1	92	12	51	73	119	536
	Admitted during 1830	21	46	290	237	628	40	1991	12	102	1558	1007	652	1251	772	362	144	411	28	1106	972	12	1231	197	861	1586	2658	18175
	Discharged	14	41	245	234	609	36	1855	11	100	1539	987	631	1173	784	347	138	385	25	1119	972	10	1244	199	870	1567	2608	17743
	Died	6	1	44	1	12	5	117	0	0	11	10	13	59	6	8	3	20	1	0	7	0	0	0	1	4	45	374
	Remaining 31st Dec. 1830 ..	1	4	1	5	22	3	100	1	2	46	42	26	89	28	18	6	29	7	59	65	3	86	7	41	90	117	894

* Distinguished only since the middle of 1830.

GENERAL RESULTS.	1827. *Per Cent.*	1828. *Per Cent.*	1829. *Per Cent.*	1830. *Per Cent.*
Proportion of admissions to numerical strength	205.515	184.898	169.935	156.008
Proportion of deaths to numerical strength	7.137	5.348	3.515	3.210
Proportion of deaths to numerical strength, excluding deaths from Cholera	6.198	4.387	3.260	2.832
Proportion of deaths to the total sick treated	3.301	2.739	1.967	1.967
Proportion of deaths to the total sick treated, excluding Cholera	2.898	2.288	1.845	4.762

FORT ST. GEORGE
MEDICAL BOARD OFFICE,
31*st October* 1831.

BY ORDER
H. S. FLEMING,
Secretary Medical Board.

NOTE.—In some instances, the number accounted for under the heads "discharged," "died," and "remaining," does not exactly correspond with the aggregate number of cases treated during the year: but the discrepancies are extremely trifling, and are to be ascribed to occasional slight variations in the arrangement of diseases in the returns of different divisions.

General Abstracts of the Returns of Sick of the Native Troops belonging to the Presidency of Fort St. George, for the years 1827, 1828, 1829, *and* 1830.

		Diseases.																										
										Fever.						Inflammation of Viscera.												
		Apoplexy.	Asthma.	Cholera.	Colic.	Diarrhœa.	Dropsy.	Dysentery.	Dysury.	Ephemeral.	Continued.	Intermittent.	Remittent.	Hepatic Diseases.	Inflammation External.	Abdominal.	Cephalic.	Thoracic.	Insanity.	Ophthalmy.	Rheumatism.	Scrophula.	Syphilis, &c.	Tumours.	Ulcers.	Wounds and Accidents.	Other complaints.	Total.
1827.																												
Average numerical strength. 84,128.	Remained 31st Dec. 1826.	0	13	8	9	22	31	51	1	0	34	857	68	5	59	3	0	10	7	25	402	15	302	0	851	124	658	3555
	Admitted during 1827....	21	119	560	320	982	256	815	17	0	1102	12501	2119	79	2187	52	51	177	76	603	5070	108	3205	543	7629	2965	11664	53221
	Discharged.....	6	106	276	312	913	198	753	16	0	1095	12919	2020	76	2131	47	47	139	72	591	4910	89	3181	491	7684	2923	11690	52679
	Died.....	12	13	283	10	63	68	76	0	0	19	142	115	11	22	6	3	34	2	2	69	5	19	2	154	12	220	1361
1828.																												
Average numerical strength 76,224.	Remained 31st Dec. 1827.	3	14	9	7	29	16	37	2	0	19	293	54	3	96	2	1	13	8	35	493	29	308	48	645	154	402	2720
	Admitted during 1828....	22	154	819	310	1105	201	646	30	0	788	10522	1396	53	2769	58	69	148	70	583	4303	95	2421	803	3954	3013	6516	40848
	Discharged.....	10	143	444	309	1048	139	595	31	0	767	10441	1335	47	2758	43	65	112	69	589	4305	103	2497	805	4336	3020	6466	40477
	Died.....	15	17	368	5	67	63	58	1	0	28	98	65	7	11	8	3	29	5	1	64	4	11	4	28	16	153	1129
1829.																												
Average numerical strength 71,945.	Remained 31st Dec. 1828.	0	8	16	3	38	15	29	0	0	11	272	48	2	104	9	2	19	4	35	420	17	208	41	232	121	280	1934
	Admitted during 1829....	20	126	501	273	983	167	496	19	0	379	7488	859	51	2787	45	30	78	70	662	3809	64	1767	688	2608	2911	6101	32982
	Discharged.....	7	108	296	270	941	103	473	16	0	370	7416	849	45	2773	45	30	72	59	665	3869	68	1810	683	2641	2892	5782	32286
	Died.....	13	17	213	2	61	63	33	0	0	13	108	43	3	7	7	2	21	1	1	51	1	15	4	9	11	142	841
1830.																												
Average numerical strength 67,106.	Remained 31st Dec. 1829.	0	9	8	4	19	18	19	3	* 0	7	236	15	4	122	2	0	4	14	31	309	12	152	38	190	127	446	1789
	Admitted during 1830....	13	158	262	293	791	96	328	15	563	358	5925	693	51	3060	37	46	94	101	639	3205	62	1275	509	2291	2958	6922	30745
	Discharged.....	2	141	141	289	746	70	305	12	528	341	5936	662	44	3035	30	45	54	101	638	3206	64	1315	522	2354	2956	6933	30470
	Died.....	11	16	126	7	47	38	31	3	2	13	78	21	8	12	8	0	37	3	1	55	4	10	4	12	13	149	709
	Remaining 31st Dec. 1830.	0	10	3	1	17	4	11	3	33	11	147	25	3	134	1	1	7	11	31	253	6	102	21	115	118	287	1355

* Distinguished only since the middle of 1830.

GENERAL RESULTS.	1827. *Per Cent.*	1828. *Per Cent.*	1829. *Per Cent.*	1830. *Per Cent.*
Proportion of admissions to numerical strength.....	63.261	53.589	45.843	45.815
Proportion of deaths to numerical strength.....	1.618	1.481	1.168	1.056
Proportion of deaths to numerical strength, excluding deaths from Cholera.	1.282	0.998	0.872	0 868
Proportion of deaths to the total sick treated.....	2.398	2.591	2 408	2.179
Proportion of deaths to the total sick treated, excluding Cholera.....	1 919	1.780	1.825	1.806

FORT ST. GEORGE
MEDICAL BOARD OFFICE,
31*st October* 1831.

BY ORDER.
H. S. FLEMING,
Secretary Medical Board.

NOTE.—In some instances, the number accounted for under the heads "discharged," "died," and "remaining," does not exactly correspond with the aggregate number of cases treated during the year: but the discrepancies are extremely trifling, and are to be ascribed to occasional slight variations in the arrangement of diseases in the returns of different divisions.

General Abstracts of the Returns of Sick of the European Troops belonging to the Presidency of Fort St. George, for the years 1831, 1832, 1833, 1834, *and* 1835.

		Diseases.																											
									Fever.						Inflammation of Viscera.														
		Apoplexy.	Beriberi	Cholera.	Colic.	Diarrhœa.	Dropsy.	Dysentery.	Ephemeral.	Continued.	Intermittent.	Remittent.	Hepatic Diseases.	Inflammation External.	Abdominal.	Cephalic.	Thoracic.	Insanity.	Puerperal Diseases.	Rheumatism.	Scrophula	Small Pox.	Venereal diseases.	Ulcers.	Wounds and Accidents.	Diseases of the Eye.	Diseases of the Skin.	Other complaints.	Total.
1831.																													
Average numerical strength 10,775.	Remained 31st Dec. 1830 ...	1	0	1	5	22	3	100	2	46	42	26	89	29	18	6	28	7	4	65	2	0	87	41	90	55	7	117	894
	Admitted during 1831	25	0	290	355	916	39	1867	190	1454	824	891	1365	843	313	113	442	21	42	876	26	0	1317	596	1602	761	173	2946	18287
	Discharged	17	0	198	353	891	34	1767	191	1452	838	885	1289	839	305	110	424	24	39	857	24	0	1324	600	1618	779	169	2877	17904
	Died	9	0	91	0	16	4	126	0	15	9	15	63	1	16	0	24	0	4	10	1	0	5	2	4	0	2	72	489
1832.																													
Average numerical strength 10,627.	Remained 31st Dec. 1831 ..	0	0	2	7	31	4	74	1	33	19	17	102	31	11	8	23	4	3	74	4	0	76	35	67	37	10	115	788
	Admitted during 1832	14	0	533	370	811	35	1558	208	1808	726	492	1135	885	286	121	560	47	34	784	23	0	1540	542	1680	747	43	2623	17605
	Discharged	3	0	289	368	793	22	1449	206	1779	723	482	1079	875	279	117	523	40	31	793	19	0	1440	538	1666	725	50	2580	16868
	Died	10	0	225	1	71	10	102	0	26	9	6	74	2	12	3	25	1	4	6	0	0	4	4	4	0	1	45	591
1833.																													
Average numerical strength 9,575.	Remained 31st Dec. 1832 ...	1	0	21	8	32	7	81	4	36	13	21	84	39	6	9	35	11	2	59	8	0	173	35	77	59	3	110	934
	Admitted during 1833	71	0	954	365	971	58	2073	293	1966	930	461	1026	830	194	141	466	32	49	807	24	0	2697	533	1467	690	121	3253	20472
	Discharged	34	0	743	366	960	33	1919	290	1948	860	433	995	825	182	138	463	37	44	812	26	0	2683	527	1473	705	113	3166	19775
	Died	37	0	228	0	23	19	155	3	19	12	21	52	3	11	6	21	3	3	5	1	0	5	0	6	1	2	51	687
1834.																													
Average numerical strength 9,821.	Remained 31st Dec. 1833 ...	1	1	4	7	20	13	80	7	35	71	28	65	25	10	2	8	4	10	49	5	1	215	39	65	43	4	132	944
	Admitted during 1834	30	5	135	224	1127	107	2096	395	2174	3664	613	1206	687	196	71	284	33	45	881	22	0	3050	631	1784	581	124	2678	22840
	Discharged	9	4	125	228	1088	87	1886	395	2129	3528	581	1128	685	185	70	264	27	36	836	22	1	3097	632	1757	592	123	2666	22181
	Died	21	1	13	2	31	23	191	2	28	40	46	69	0	13	0	14	3	15	13	0	0	8	1	15	0	0	50	599
1835.																													
Average numerical strength 9,531.	Remained 31st Dec. 1834 ...	1	1	1	1	28	10	99	5	52	166	15	74	27	6	1	9	7	4	81	5	0	160	37	76	32	5	101	1004
	Admitted during 1835	11	2	61	187	608	67	1230	408	1243	2314	147	1004	717	210	1	261	17	55	1144	17	0	2719	609	1620	546	190	3149	18539
	Discharged	7	2	60	185	601	56	1162	407	1241	2412	146	982	721	197	2	254	20	33	1134	20	0	2710	586	1612	553	192	3044	18339
	Died	5	1	2	0	13	14	101	2	28	11	11	35	0	9	0	7	1	18	7	0	0	6	2	5	1	0	38	312
	Remaining 31st Dec. 1835 ..	0	0	0	3	22	7	66	4	31	57	5	61	23	10	0	9	3	8	84	2	0	163	58	79	24	3	168	890

GENERAL RESULT.

	1831. *Per Cent.*	1832. *Per Cent.*	1833. *Per Cent.*	1834. *Per Cent.*	1835. *Per Cent.*
Proportion of admissions to numerical strength	169.716	165.662	213.806	232.562	194.491
Do. of deaths to numerical strength	4.583	5.561	7.174	6.099	3 273
Do. of do. to do. excluding Deaths from Cholera	3 693	3.444	4.793	5 966	3.252
Do. of do. to the total sick treated	2.549	3.213	3.209	2 518	1.596
Do. of do. to the do. excluding Cholera	2.106	2.049	2.246	2.478	1 591

FORT ST. GEORGE.
Medical Board Office.

NOTE.—In a few instanes, th number accounted for under the heads "discharged," "died," and "remaining," does not exactly correspond with the aggregate number of cases treated during the year: but the discrepancies are extremely trifling, and are to be ascribed to occasional slight variations in the arrangement of diseases in the returns of different divisions.

General Abstracts of the Returns of Sick of the Native Troops belonging to the Presidency of Fort St. Grorge, for the years 1831, 1832, 1833, 1834, *and* 1835.

		Diseases.																												
									Fever.						Inflammation of Viscera.															
		Apoplexy.	Beriberi.	Cholera.	Colic.	Diarrhœa.	Dropsy.	Dysentery.	Ephemeral.	Continued.	Intermittent.	Remittent.	Hepatic Diseases.	Inflammation External.	Abdominal.	Cephalic.	Thoracic.	Insanity.	Pulmonary Diseases.	Rheumatism.	Scrophula.	Small Pox.	Venereal diseases.	Ulcers.	Wounds and Accidents.	Diseases of the Eye.	Diseases of the Skin.	Other complaints.	Total.
1831.																														
Average numerical strength. 61,623.	Remained 31st Dec. 1830...	0	0	3	1	17	4	11	33	11	147	25	3	155	3	1	6	11	10	253	7	0	96	112	120	31	22	273	1355
	Admitted during 1831.....	12	0	639	363	941	97	394	1962	320	4693	611	53	3941	43	23	98	76	119	2776	74	0	1222	1676	2644	619	285	5965	29646
	Discharged.....	2	0	345	360	900	47	354	1933	311	4646	584	45	3951	41	23	76	76	106	2765	68	0	1210	1667	2651	616	287	5809	28873
	Died.....	10	0	271	1	43	43	32	8	16	68	28	5	11	3	0	21	5	14	46	3	0	8	15	13	2	4	141	811
18 2.																														
Average numerical strength. 60,678.	Remained 31st Dec. 1831...	0	0	26	3	15	11	19	54	4	126	24	6	131	2	0	9	6	9	218	10	0	89	106	103	12	19	285	1317
	Admitted during 1832.....	17	0	808	304	830	131	515	3411	339	6247	840	50	3439	43	19	103	67	109	2477	50	0	880	2073	2856	615	538	6690	33451
	Discharged.....	2	0	485	305	788	86	460	3261	314	6059	802	52	3455	37	19	80	64	97	2469	51	0	890	1983	2838	614	529	6361	32101
	Died.....	13	0	333	0	34	46	47	10	20	93	28	3	8	8	0	25	2	16	52	0	0	4	14	20	2	8	183	969
1833.																														
Average numerical strength. 60,099.	Remained 31st Dec. 1832...	2	0	16	2	23	11	27	194	9	221	34	1	103	0	0	7	7	5	174	9	0	85	182	103	31	20	432	1698
	Admitted during 1833.....	13	0	1228	281	999	131	598	4985	324	7535	909	53	3340	46	12	91	68	116	2481	48	0	1366	1716	2451	805	442	5877	35915
	Discharged.....	4	0	662	280	938	92	539	5055	306	7293	866	43	3320	35	11	60	58	94	2410	46	0	1297	1750	2429	806	429	5850	34673
	Died.....	11	0	579	3	59	40	66	22	15	132	35	9	20	10	1	29	5	20	52	3	0	11	12	9	1	4	206	1354
1834.																														
Average numerical strength. 58,854.	Remained 31st Dec. 1833...	0	33	3	0	27	9	20	2	12	332	41	3	96	3	1	7	13	14	194	10	4	154	137	129	31	73	138	1586
	Admitted during 1834.....	13	235	115	239	1261	217	848	5305	811	18833	1024	69	2652	66	22	121	73	167	2965	71	79	1668	1713	3078	569	2194	3096	47504
	Discharged.....	4	219	58	235	1190	129	728	5290	759	18307	971	55	2641	54	23	100	73	133	2842	68	74	1690	1710	3041	567	2163	2939	46063
	Died.....	9	28	58	2	75	64	105	26	42	239	53	10	12	10	0	21	4	34	45	5	5	14	12	17	1	0	135	1026
1835.																														
Average numerical strength. 56,777.	Remained 31st Dec. 1835...	2	21	2	2	23	33	35	91	18	624	41	7	95	5	0	7	9	14	275	8	4	112	127	152	32	103	160	2002
	Admitted during 1835.....	11	208	12	268	749	191	541	4300	720	14614	615	68	3127	71	0	65	111	178	3373	51	25	1131	2004	2952	856	2990	2776	42007
	Discharged.....	6	177	12	265	715	160	482	4297	672	14639	591	62	3103	66	0	54	101	144	3316	53	30	1135	1978	2892	858	2930	2693	41434
	Died.....	7	23	2	3	37	49	70	21	36	190	40	9	5	5	0	11	4	32	43	0	0	10	8	14	2	2	100	723
	Remaining 31st Dec. 1835...	0	29	0	2	20	15	24	73	29	410	25	4	114	5	0	7	14	16	289	6	0	98	148	198	28	160	144	1852

GENERAL RESULTS.

	1831. *Per Cent.*	1832. *Per Cent.*	1833. *Per Cent.*	1834. *Per Cent.*	1835. *Per Cent.*
Proportion of admissions to numerical strength	48.108	55.128	59.759	80.714	73.985
Do. of Deaths to numerical strength	1.316	1 596	2.252	1.743	1.273
Do. of do. to do. excluding deaths from cholera	0.876	1.048	1-289	1 644	1.269
Do. of do. to the total sick treated	2.616	2.787	3.579	2.090	1.642
Do. of do. to the do. excluding cholera	1.778	1.874	2.130	1.976	1.638

FORT ST. GEORGE.
Medical Board Office.

NOTE.—In a few instances, the number accounted for under the heads "discharged," "died," and "remaining," does not exactly correspond with the aggregate number of cases treated during the year: but the discrepancies are extremely trifling, and are to be ascribed to occasional slight variations in the arrangement of diseases in the returns of different divisions.

No. 16.

Tabular View of the Meteorology of the Convalescent Station of the Mahabuleshwur

Months.	Temperature in the Shade.										Solar Radition.			
	Means.						Extremes.				Means.		Extremes.	
	Mean Temperature.	Mean daily Variation	Mean Maximum.	Mean Minimum.	Mean Temperature at 9 A. M.	Difference of meanTemperature of each successive Month.	Extreme daily Variation.	Extreme Monthly Variation.	Extreme Maximum.	Extreme Minimum.	Mean Maximum Temperature in the Sun.	Mean Amount of Solar Radiation.	Extreme Maximum Temperature in the Sun.	Extreme Amount of Solar Radiation.
October ...	67.1	11.8	73.0	61.2	69.2	2.3	14.5	18.5	76.5	58.0	127.9	54.8	151.5	75.0
November.	62.8	10.3	68.0	57.7	63.2	4.3	13.7	16.7	70.5	53.8	109.6	41.4	134.0	66.0
December .	60.9	11.9	66.9	55.0	61.0	1.9	15.4	22.7	71.5	48.8	118.2	51.3	132.5	62.3
January ...	62.8	13.4	69.5	56.1	63.0	1.9	17.0	22.5	73.0	50.5	120.5	51.0	138.0	66.7
February...	66.4	14.1	73.5	59.4	67.8	3.6	20.0	32.1	79.5	47.4	130.6	57.1	143.0	68.2
March	70.7	15.8	78.6	62.8	72.6	4.3	20.5	26.0	64.0	58.0	139.1	60.5	149 0	69.7
April	73.3	16.6	81.6	65.0	75.2	2.6	20.6	34.3	90.5	56.2	138.4	56.8	148.0	70.2
May.....	74.1	15.6	81.9	66.3	75.9	0.8	22.0	27.7	89.0	61.3	139.0	57.1	150.0	66.8
June	65.5	7.9	69.5	61.6	68.0	8.6	18.5	21.8	78.3	56.5	* 117.8	44.2	134.0	55.7
July.... ..	63.2	2.9	64.7	61.8		2.3	8.0	10.0	70.0	60.0				
August....	63.2	2.9	64.7	61.8		0.0	8.0	10.0	70.0	60.0				
September.	65.0	4.8	67.4	62.6		1.8	11.0	14.0	74.0	60.0				
Annual means and Extremes.	66.25	10.66	71.60	60.94	68.43	2.86	22.0	34.3	90.5	47.4	126.78	52.77	151.50	75.0

* The indications of the Thermometer in the sun, and the moist bulb-

Tabular view of the Meteorology of the Convalescent Station on the Mahabuleshwur

Seasons.	Mean Temperature.	Mean daily Variation of Temperature	Mean Maximum Temperature.	Mean Minimum Temperature.
Cold Season—1st October to 28th Feb.	64.00	12.30	70.18	57.88
Hot Season—1st March to 31st May ..	72.70	16.00	80.70	64.70
Rainy Season—1st June to 30th Sept .	64.22	4.62	66.57	61.95

Remarks.

The Mean Temperature for the year has been only $\frac{1}{10}$th of a degree below the Octennial average, with 1° 3′ greater daily variation, which was principally given by the mean Minima Temperatures.

The *Cold* season was the most genial one I have experienced at the station, and peculiarly favourably for invalids. (No rain in October.)

The *Hot* season approximated the average very nearly, in its Mean Temperature: but the daily variation exceeded by nearly 3° the octennial average, which was divid-

Hills, for each month, from October 1st 1836, to September 30th 1837. By J. Murray, Esq.

Humidity.		Rain.					Winds.		Appearance of the Sky, &c.
Means	Extremes								
Mean depression of moist bulb Thermometer.	Extreme depression of moist bulb Thermometer.	Night fall.	Day fall.	Total Monthly fall.	No. of rainy days.	Extreme daily fall.	Direction.	Force.	
11.3	15.2	..	..	..	..	..	E.W. N.	Light	Clear.
8.2	13.8	4.00	1.39	5.39	7	4.32	NE. NW.	Fresh	Clear. First week cloudy.
8.4	11.0	..	..	..	..	..	N.E.	"	Clear.
9.9	12.5	0.02	..	0.02	1	0.02	ENE. W.	Light	" [days.
14.1	18.6	..	..	..	..	..	" "	"	Clear small Cumuli last 10
15.1	21.3	0.30	..	0.30	1	0.30	" "	Fresh	Cirrho-Cumuli.
16.5	23.5	..	0.32	0.32	3	0.22	" "	"	Cumuli. [light fogs.
14.9	24.0	..	..	..	..	..	E. W.	Moderate	Cumuli, with occasional
*									
3.4	6.0	10.38	18.50	28.88	21	8.00	W.	High	Fogs, with sunshine.
		45.93	45.16	91.09	30	7.22	WSW.	"	Dense fogs.
		52.95	54.99	107.94	29	12.67	"	"	"
		11.98	14.76	26.74	27	2.37	W.	Fresh	Passing fogs.
11.31	24.0	125.56	135.12	260.08	123	12.67			

Thermometer for June, includes only the first 13 days of the month.

Hills, for each Season from October 1st 1836, to September 30th 1837.

Mean Maximum Temperture the Sun.	Mean Amount of Solar Radiation.	Difference of mean Temperature of coldest and hottest months.	Difference of mean Temperature of each season and the annual means.	Difference of mean daily variation of each season and the annual mean.	Difference of mean Temperature of each successive season.
121.36	51.12	6.20	2.25	1.64	0.22
138.83	58.13	3.40	6.45	5.34	8.70
..	..	2.30	2.03	6.04	8.48

ed pretty equally between the Maxima and Minima Temperatures. This increased range of Temperature was probably the cause of the prevalence of Catarrhs, both among European children and adults. Scarcely any fogs in May, and an unusual prevalence of Easterly winds during that month.

The *Rainy* season was unusually boisterous, particularly in the latter half of August. The annual fall of rain exceeded the average by 21 inches. In 10 days (from 20th to 29th August inclusive) there fell, inches 83 70, being a daily average of 8 37. An unusually long break in the first half of August.

No. 17.

Case of Dysentery with Sloughing and Discharge of a portion of the Intestinal Canal.

J. T. æt. 40, admitted into the European Hospital, April 22d 1835, stated that for six or seven days he had been suffering from bowel complaint with frequent and often ineffectual calls to evacuate the bowels. There was tenderness across the abdomen on pressure, with slight heat of skin, and frequency of pulse. On the 23d the tenesmus continued, and towards evening an increase of pain of abdomen was relieved by an anodyne enema and warm bath; on the 24th it is reported, that during the night there had been six copious, feculent evacuations without tenesmus, and during the day four evacuations scanty and mucous; on the 25th five evacuations feculent and bilious; and "at 8 P. M. there was expelled *per anum* a portion of intestine about seven inches in length. Says he was not sensible of its presence in the rectum, but first perceived it when partially expelled and retained at one end by the sphincter muscle; the gut appears to be in a putrid state."

The patient continued in hospital with relaxed and irregular bowels till the 9th May, when he left much improved in health. He was the carpenter of a ship, and had made twelve voyages to India. Health in general good, and with the exception of one attack of cholera, had never suffered from serious disease: there was tendency to constipation, but to no considerable extent, and there never had been suffering from any other affection of the bowels.

No. 18.

Case of Tetanus extracted from Dr. McLennan's Report of the Presidency Native General Hospital, for the half year commencing on the 1*st January, and terminating on the* 1*st July* 1835.

One case of Tetanus arising from a wound on the shin, inflicted by the kick of a horse, and the passage of a buggy wheel over the instep, has been successfully treated by repeated leeching and blisters to the spine, purgatives of ol terebinthinœ, the administration of large doses of opium and calomel internally, and the rubbing in of large quantities of mercurial ointment. On the occurrence of ptyalism the symptoms gradually yielded. This has been a most satisfactory case: the man had suffered much from fever before the receipt of the injury, was not brought into hospital till the 7th day of the disease, and did not then seem as if he could have lived twelve hours. Three other cases not more unpromising in appearance, treated almost at the same time, and on the same plan, have proved fatal: of these, one from a bruise on board ship, and in a man

who had been ill several days, died twelve hours after admission; another, a great drunkard, who was said to have been beaten, but on whose body there were no marks of violence, admitted on the 3d day of the disease, died 3 days afterwards; and the third likewise, a man of dissipated habits, and of whose history nothing could be learnt, died 18 hours after admission. I may mention that in the case which terminated successfully, the man's pulse was not below 130 for many days.

No. 19.

Form of Meteorological Table, recommended by the Committee for general adoption.

To ensure that uniformity essential to the value of a series of meteorological observations, the following mode of observing, registering, and calculating, is recommended for general adoption. Observers anxious to pursue the science more in detail, can make the additions necessary to meet their respective views.

Instruments. Two thermometers, one with the bulb dry, the other with the bulb constantly wetted, to be placed near to each other, and freely exposed to the external air in an open and shaded verandah, removed from all sources of radiation and reflection of caloric. A north-easterly exposure is the most desirable, as being the least liable to be affected by the solar rays.

Two observations to be made daily, viz. at the hours of *minimum* and *maximum* temperature. These hours will be found to vary in different climates, but may easily be ascertained by making observations every hour, or second hour for two or three days. In tropical climates the minimum will generally be about day light, and the maximum about two P. M.

The object of the thermometer with the wetted bulb is to afford information relative to the comparative state of moisture of the atmosphere, by observing the temperature indicated by it, and by the dry bulbed thermometer, and recording the difference or depression e. g. :

Dry bulb.	Moist bulb.	Depression.
80	70	10

The difference, or amount of depression of the temperature of the wetted thermometer, will vary according to the amount of evaporation from the surface of its bulb, and this latter event will of course, depend on the greater or less degree of moisture in the atmosphere, at the period of observation.

For comparison of one day with another, one month with another, or one place with another, the hygrometrical information thus acquired, though not minute, will be valuable.

The bulb of the thermometer, can be kept constantly wetted without difficulty, by covering it with two folds of thin muslin, and passing a few threads of worsted between them. A small weight to be attached to each end of the threads, and placed in a cup: one cup to be fixed on a stand above the bulb, and kept filled with water; the other cup to be fixed below the bulb, for the purpose of receiving the water which may pass from the upper one, along the threads; or the bulb thus arranged may be wetted as the hour for observing, approaches.

TABLE.

Meteorological observations at *for the month of*

year.	Thermometer.				Pluviometer.			Wind.				Weather, &c.	
Dates and Phases of the Moon.	Minimum at A. M.		Maximum at A. M.					A. M.		P. M.			
	Temperature.	Depression of wet bulb.	Temperature	Depression of wet bulb.	During night.	During day.	Total.	Direction.	Force.	Direction.	Force.	A. M.	P. M.
1													
2													
3													
4													
5													
6													
7													
8													
&c.													
Means													

The table to occupy the full breadth of an open sheet of foolscap paper, one half for the tabular portion, the other, for the remarks on the weather, clouds, &c. On the reverse side of the sheet the following results to be noted.

Mean Temperature.
„ Maximum.
„ Minimum.
„ Daily variation.
Extreme Maximum.
„ Minimum.
Mean depression of moist bulb.
Extreme do. do.

Amount of rain, inches.
Number of days on which rain fell.
Prevailing winds... { A. M. / P. M.

General remarks on the weather of the month, embracing a recapitulation of the leading phenomena, &c.

MODE OF CALCULATING.

In calculating, let each column of daily observations be added up, and divided by the number of days on which, observations have been made, the quotient will be the monthly mean of each column.

To determine the mean temperature of the month, add together the monthly means of the *minima* and *maxima* observations, and divide by 2, the quotient will be the mean temperature of the month.

To obtain the mean daily range for the month, subtract the monthly mean of the *minima* observations, from the monthly mean of the *maxima* observations, the remainder will be the mean daily range.

Should tables of this nature, be forwarded regularly by members of the society, the information they contain, will be from time to time communicated to the society, in a condensed form.

Before concluding, the committee would direct the attention of members, to the following extract from Sir J. Herschell's instructions for making, and registering meteorological observations in Southern Africa, &c. they would strongly recommend the co-operation required, and will have much pleasure, in being the channel of its transmission to the secretary of the South African Literary, and Philosophical Society.

"With a view, however, to the better determining the laws of the diurnal changes taking place in the atmosphere, and to the obtaining a knowledge of the correspondence of its movements, and affections over the whole globe, the committee have resolved to recommend, that four days in each year should henceforward be especially set apart by Meteorologists in every part of the world, and devoted to a most scrupulous, and accurate *registry* of the state of the barometer, and thermometer; the direction and force of the wind; the quantity, character, and distribution of the clouds; and every other particular of weather, throughout the whole twenty four-hours of those days, and the adjoining six hours of the days preceding and following.* The days they have been induced to fix on

* "This is necessary by reason of the want of coincidence of *the day* in different parts of the globe, arising from difference of longitude. In order to obtain a complete correspondence of observation for 24 successive hours over the whole globe, it must be taken into account that opposite longitudes differ 12 hours in their reckoning of time. By the arrangement in the text the whole of the *astronomical day* (from noon to noon) is embraced in each series, and no observer is required to watch two nights in succession."

and recommend for these observations are, the 21st of March, the 21st June, the 21st September, and the 21st December, being those or immediately adjoining to those of the equinoxes and solstices, in which the solar influence is either stationary or in a state of most rapid variation. *But should any one of those 21st days fall on Sunday, then it will be understood that the observations are to be deferred till the next day the 22d.*

The observation at each station should commence at 6 o'clock A. M. of the days, and terminate at 6 o'clock P. M. of the days following, according to the usual reckoning of time at the place. During this interval, the barometer and thermometer should be read off and registered hourly, or at all events, at intervals not more than two hours asunder, and the precise hour *and minute* of each reading should be especially noted.

For obvious reasons, however, the commencement of every hour should, if practicable, be chosen, and every such series of observations should be accompanied by a notice of the means used to obtain the time, and when practicable by some observation of an astronomical nature, by which the time can be independently ascertained within a minute or two;* as there is scarcely any class of observations by which meteorology can be more extensively and essentially promoted, it is hoped that not only at every station of importance in this colony, but over the whole world, and on board ships in every part of the ocean, individuals will be found to cooperate in this enquiry. Every communication of such observations, addressed by channels as secure and as little expensive as possible to the secretary of this institution, will be considered as highly valuable."

No. 20.

Proceedings connected with the establishment of the Medical and Physical Society of Bombay.

At a meeting of Medical Officers, held at the office of the Medical Storekeeper, Bombay, on the 20th November 1835.

Present,

C. Collier, Esq. Deputy Inspector General of Hospitals; G. A. Stuart, Esq. Superintending Surgeon; L. Hathway, Esq. 8th Regiment N. I; J. Walker, Esq. Medical Storekeeper; G. H. Davis, Esq. Artillery; J. Harcourt, Esq. H. M.'s 2d or Queen's Royals; J. Scott, Esq. Secretary Medical Board; S. Fraser, Esq. Acting Assay Master; C.

* For example, the first appearances and last disappearances of the sun's upper and lower border, above and below the sea horizon, if at sea or on the coast; or, on land, the exact length of the shadow of a vertical object of determinate length on an horizontal level, at a precise moment of time (not too near noon), &c.

Morehead, Esq. Surgeon to the Right Hon'ble the Governor; A. Hardy, Esq. Engineer Corps.

Mr. Collier, Deputy Inspector General, was requested to take the chair, and Dr. Morehead, to officiate as secretary. The meeting was subsequently joined by G. Smyttan, Esquire, 2d Member Medical Board, and M. Kays, Esquire, Vaccinator at the Presidency, and a letter was received from Dr. McLennan, expressive of his regret at being unable to attend.

The following proposal for establishing a Medical Society recently circulated to the Services, and bearing very numerous assenting signatures, was then read.

(Circular.)

"It is in contemplation, should it meet the sense of the majority of the Medical Service of the Bombay Presidency, to attempt the institution of an Association, for the purpose of furthering the advancement of Medical Science with its collateral branches.

"The Calcutta Medical and Physical Society has done much toward these important objects, but its influence from distance and other causes has not been much felt in this Presidency, and it is to supply this deficiency that the present proposal is made.

"It will be for the Association when it has assumed some form, to establish the rules by which it is to be worked.

"The chief object will probably be, to hold out inducement to Members of the Service to communicate information on the different branches of Medical Science, for eventual publication in the form of a volume of Transactions, when material of quality and quantity sufficient shall, have been collected.

"The object of the present circular is to invite those gentlemen who are favourable to the proposed measure, to annex their names, when they will be requested to offer suggestions and to appoint (in a manner similar to that in force in the different funds) a Central Committee, and entrust it with the duty of forming regulations, and putting the association into a working shape.

"The only additional remark which it is necessary to make, is, that the expense to individuals will be inconsiderable, as the only demands upon the funds of the association, will be charges for printing their transactions when the period for doing so shall have arrived."

After which, the following Resolutions were passed.

1st. The opinion of the Medical Officers serving on this Establishment, having been found to be generally in favor of the institution of a Medical society on the principle of the prospectus now read, Resolved—That

such society be established, and that a temporary committee be nominated to carry the proposals of that circular into effect.

2nd. Resolved—That this temporary committee shall consist of J. Walker, J. Scott, and C. Morehead, Esquires.

3rd. Resolved—That the committee prepare, and circulate generally on this establishment, an outline of the objects of the society and of the manner in which they consider, it may best be organized and conducted.

4th. Resolved—That by this circular the opinion and suggestions of Medical Officers, be invited on the points of which it treats, and their votes obtained for the election of a permanent committee, to consist of five members and a secretary, by whom the regulations shall be framed and the society brought into operation.

5th. Resolved—That the temporary committee be empowered to address to Government a request, that the printing of the present proceedings and the subsequent circular, may be executed free of expense at the Government Press, and that their circulation be permitted free of postage, under the signature of one of the members.

(Signed) C. Morehead,
Officiating Secretary.

In compliance with the 5th Resolution of the meeting the committee addressed the following letter to Government.

To W. H. Wathen, Esq.
Secretary to Government.

Sir,

As a Committee appointed at a late meeting of the Medical Officers at the Presidency, we have the honor to state for the information of the Right Hon'ble the Governor in Council, that it was then resolved, in unison, with the declared general wish of the Medical Officers of both Services on this establishment, to institute a Medical Society of Bombay, similar in its nature and objects to that, which has for twelve years past been so beneficially in operation at Calcutta.

To us has been entrusted the task of preparing and circulating for the opinion and suggestions of Medical Officers, an outline of the proposed institution, and of obtaining their individual votes, for the election of a permanent committee of organization and management, and we have been instructed by the meeting, to request the aid of Government in the execution of these duties, by permission, to have the requisite papers and circular printed at the Government Press free of expense, and to correspond post free on the business of the society, under the signature and address of one of our members, the secretary of the Medical Board.

We respectfully trust that Government, in consideration of the important public objects which the success of our undertaking is calculated to

promote, will be graciously pleased to grant us this favor, and when the society shall be finally established, and in operation, to extend to it further, that countenance and protection which its public utility may merit, and on which, the extent of its success must in a great degree depend.

(Signed) J. WALKER,
J. SCOTT,
C. MORIHEAD.

Bombay, 23rd November 1835.

The committee, have much satisfaction in subjoining the reply received from the Right Hon'ble the Governor in Council.

No. 2492, of 1835.

General Department.

To J. WALKER, ESQ.
And Members of the Medical Committee.

GENTLEMEN,

I am directed to acknowledge the receipt of your letter of the 23d instant, and to inform you, that the Right Hon'ble the Governor in Council views, with very great pleasure the institution of a society, from whose zealous exertions such beneficial results may be confidently expected, and will have much pleasure in affording it all possible aid and countenance.

2nd. I am further directed to inform you, that the Governor in Council is pleased to allow the requisite papers and circular of the committee to be printed at the Government Press, free of expense, and to permit the committee to correspond post free on the business of the society, on the signature and address of one of your committee, the secretary to the Medical Board.

I have the honor to be, &c.
(Signed) W. H. WATHEN,
Secy. to Govt.

Bombay Castle, 30th November 1835.

CIRCULAR.

In conforming to the 3rd Resolution passed at the meeting, the committee feel, that they cannot better express their opinion of what should constitute the objects of the society, than by reprinting the following summary contained in the prospectus, circulated by the committee of management of the Calcutta Medical and Physical Society at the period of its institution.

"1st. The Meteorology and Medical Topography of the various districts of India, and the peculiarities of the inhabitants of each with reference to their physical configuration.

" 2nd. The Diseases of the country as they effect both Europeans and Natives, with their treatment, adhering closely to ascertained facts, and deriving them if possible from local and personal experience.

" 3rd. The Diseases peculiar to Natives and the mode of treatment followed by native practitioners, together with the received opinions as to their nature and causes.

" 4th. Description of Surgical Instruments, and of the mode of operating among the Natives.

" 5th. The Materia medica of Hindoostan, whether animal, vegetable, or mineral productions of the country, or artificial compounds employed in Native practice, with their chemical analysis.

" 6th. The History of Medical Science in generel, in the east, both in its past and present condition.

" 7th. Description of plants unknown to the Botany of Europe, either with or without reference to their medical virtues.

" 8th. Descriptions of animals, either unknown to, or but imperfectly described by European zoologists.

" 9th. Accounts of diseases affecting the lower animals, as the horse, camel, and others more particularly valuable from their services to man.

" 10th. Dissections of all the varieties of animals, with their peculiarities of structure and whatever is comprehended under the term of Comparative Anatomy."

The committee would further recommend, that endeavours should be made to obtain from Government and the Medical Board, the use of such recorded documents in their possession, as relate to the objects of the society, aud to gain the general cordial co-operation of those officers of the other branches of the public service, whose position may be favourable to the furtherance of statistical and general scientific research.

To the establishment of a museum also, as an object of much importance, the committee would recommend early attention.

With regard to the organization of the society, the committee beg to offer the following suggestions.

1st. The society to be established on principles similar to those of the Medical and Physical Society of Calcutta, under the management of a committee, and office-bearers, appointed by the general vote of members from among those stationed at the Presidency.

2nd. The society to hold monthly meetings for the reading, and discussion of papers presented, and for the communication and interchange of opinions on subjects connected with the advancement of medical knowledge. An abstract of the proceedings of each meeting and of the, papers read and discussed to be printed, and a copy of it transmitted to every member.

3rd. From the proximity of Poona to the Presidency, and the large number of members likely to be always stationed there, it might be desirable to transmit the papers read at each monthly meeting of the society, to be laid in like manner before a meeting of the subscribers there.

4th. A volume of the following nature to be published half yearly if practicable.

First. Original communications whether received from members, or from Government, or the Medical Board, which shall be recommended for publication, by the committee of papers.

Second. A report for the past half year, drawn up by the secretary of the society, from such documents as may have been placed at the disposol of the society, by Government or the Medical Board. This report to be read at a meeting of the society before publication.

The propriety of annexing a separately paged appendix, consisting of selections of interest from medical works and periodicals, may be a subject of future consideration.

5th. The expences of the society will almost entirely consist in the charges of publication and of the museum. It is impossible, as yet, to calculate with any certainty to what these will amount, but the committee consider that the contributions of members, might with propriety be fixed for the present at a donation of Rs. 15, and a monthly subscription of 2 Rs. payable annually in advance.

Pursuant to the resolution passed at the meeting, held on the 20th November 1835.

Voting lists were circulated by the temporary committee to the members of the society, for the election of a committee of management to consist of *five members, and of a secretary:* the following gentlemen were elected.

Committee.

G. Smyttan, Esq, J. Walker, Esq.
C. Collier, Esq. J. McLennan, Esq.
J. Bird, Esq.

Secretary C. Morehead, Esq.

The members of the Medical Board of Bombay, and the Deputy Inspector General of Hospitals at Bombay, were requested to become the Patrons of the society *Ex officio,* to which they assented, and the following code of regulations, for the future management of the society, was drawn up by the committee.

Regulations of the Medical and Physical Society of Bombay.

1. The society shall consist of two classes, viz. ordinary members, and corresponding members.

2. The society shall be under the direction of a committee of management consisting of *five members, and of a secretary*, the latter to be a member of the committee *ex officio*.

Ordinary Members.

1. Under the head of ordinary members are classed all who contribute to the funds of the society.

2. All medical men who can produce certificates of a regular medical education, shall be eligible as ordinary members.

3. Any medical officer of His Majesty's or the Hon'ble Company's service, will be enrolled an ordinary member of the society, on his expressing a wish to that effect, by letter addressed to the *secretary* of the society.

4. Any qualified person not belonging to His Majesty's or the Hon'ble Company's service, proposed by three ordinary members, by letter addressed to the *secretary* of the society, shall he elected an ordinary member.

5. Ordinary members to be divided into *resident and non-resident*, the former to include all resident under the Government of Bombay, the latter all stationed, elsewere in India.

6. Resident members to pay an admission fee of *five* rupees and contribute *six* rupees half yearly to the funds of the society.

7. Non-resident members to contribute *six* rupees annually to the funds, and not to be charged with an admission fee.

8. Such members as may leave India for Europe, or may be obliged to proceed to sea on account of sickness, shall be exempted from paying the contribution during their absence.

Corresponding Members.

I. Medical men *not* residing in India, as well as men of liberal education residing in India, but not belonging to the medical profession, to be eligible as corresponding members.

2. Any qualified person proposed by six ordinary members, by letter addressed to the *secretary*, to be considered a corresponding member of the society.

Office Bearers.

1. The committee of management to be elected *annually* from among the ordinary members residing at Bombay, by the general vote of the ordinary *resident* members of the society. The *secretary* to be elected *biennially* in a similar manner.

2. The voting list to be circulated in the first week of November of each year, that the result of the election may be determined before the beginning of the succeeding January.

3. The chairman of the committee to be elected by the members of the committee, and to have a casting vote when the exercise of such privilege, shall be necessary.

4. In the event of a vacancy occurring in the committee, between the periods of election, the vacancy to be filled up by the individual who commanded the number of votes, *next* to those, of the members returned at the last election.

Committee of Management.

5. To have the general direction of the affairs of the society, and to determine on, what cammunications are to be published in the *transactions* of the society.

6. The committee of managemənt when in doubt, may submit any question for decision by the majority of votes of the ordinary resident members, and will at all times give due consideration to suggestions submitted by members of the society.

Secretary.

7. The secretary shall, in communication with the committee of management, conduct all the details of business and carry on the correspondence of the society.

8. He shall receive and take charge of all communications addressed to the Society, and shall in communication with the committee of management publish, as frequently as circumstances may from time to time determine, an abtract of the proceedings of the society; a copy to be forwarded to every member.

This abstract to contain a short sketch of the contents of communications, received either from individual members, the Medical Board, or other sources.

9. The secretary to act as treasurer, and submit a statement of receipts and disbursements to the society, annually, or oftener when required.

10. To enable him to perform these duties, he shall entertain such an establishment as the committee of management shall from time to time sanction.

Papers and Dissertations.

1. All papers on the objects of the society, to be transmitted to the secretary, who, after having prepared an abstract for publication, shall put the original paper in circulation amongst the members resident at Bombay, and Poona, and subsequently place it, in the records of the society.

Any member resident elsewhere in the presidency of Bombay, wishing to peruse a particular paper, may have it sent to him, on application to that effect, being made to the secretary.

2. Whenever a number of communications sufficient to form a small octavo volume, shall have accumulated, the committee of management to decide, on such as are to be published in the transactions of the society.

Each volume will, in addition, contain a summary of all other interesting information, which may have been communicated to the society.

3. A copy of each volume of transactions to be supplied to every member.

Appendix. No. 1.

The committee have thought it advisable to dispense for the present, with the idea of holding periodical meetings of the society, at Bombay. They have been led to this determination, in consequence of the small number of resident members, rendering such measure of very doubtful success. It is one moreover, which will easily admit of being grafted on the institution as now organized, should such step appear advisable. For similar reasons the establishment of a museum and library has not been considered.

No. 2.

The Committee will cultivate every opportunity of multiplying, the sources from which information may be obtained, and they have reason to believe, that valuable statistical information of a certain order, will be made available to the society. The committee would, with every deference to individual opinion, allude to the additional value given to research by uniformity in the manner of conducting it: and when from time to time they venture to suggest the manner, in which such object may be best attained, they trust that their motives will not be misconstrued; the committee in these remarks have chiefly in view, *the want of value of recorded Meteorological observations from the absence of uniformity in the methods of observing and of calculating the result of observations.*

No. 3.

All letters and communications on the business of the society, to the address of the secretary, are permitted to pass free of postage.

To the Secretary of the Medical and Physical Society, Bombay.
(Name of the Writer.)

No. 4.

The committee convinced. that every member will feel an interest in the success of the Institution, have thought it unnecessary, to make detailed regulations relative to the mode of payment of donation and subscription, *they would now only remark, that it will be for the advantage of the society, that payments be made half yearly, or annually in advance.*

Members are requested to remit all sums on account of the society to Messrs. Leckie and Co. who have kindly undertaken to act as Agents.

Bombay, March 1st, 1836.

No. 21.

Monthly and Quarterly Proceedings of the Medical and Physical Society of Bombay.

Proceedings from March 8th, to April 15th, 1836.

MEMBERS ELECTED.

Corresponding.

W. H. Wathen, Esquire, Chief Secretary to Government, T. Williamson, Esquire, Revenue Commissioner.

Ordinary.

R. H. Kennedy, Esquire, M. D. Superintending Surgeon; W. Mackie, Esq. Surgeon; W. K. Fogerty, Esq. Surgeon; J. Stewart, Esq. M. D. Assistant Surgeon, Bombay establishment.

In conformity to Regulations 3 and 4, under the head "Office Bearers" G. Smyttan, Esq. 2nd Member of the Medical Board, was elected chairman of the committee, and J. Scott, Esq. secretary Medical Board, was, elected member of the committee, in succession to J. Walker, Esq. absent on sick leave.

COMMUNICATIONS PRESENTED.

1. A letter from W. H. Wathen, Esq. Chief Secretary to Government, communicating the assent of Government to the transmission, free of postage, of all letters on the business of the society, under the signature, or to the address of its secretary, and also the permission to have occasional circulars printed at the Government Press, as a temporary indulgence.

2. A letter from the secretary to the Medical Board, expressing the pleasure of the Board, in accepting the invitation to become patrons of the society, and also their readiness, should the sanction of Government be obtained, to place at the disposal of the society, all documents relating to its objects.

3. A letter from the Deputy Inspector General of Hospitals, Bombay, expressing his readiness to give the full assistance of his office, for the furtherance of the objects of the society.

4. A letter from Messrs. Leckie & Co. expressing their willingness to become agents of the society.

5. A letter from the secretary to the Medical Board, stating, that the Board see difficulties in at present complying with the request of the committee; that Government be recommended to place an hospital servant at the disposal of the committee, but expressing their intention of giving the measure, their support and consideration should an opportuuity occur.

6. A letter from W. H. Wathen, Esq. Chief Secretary to Government, acknowledging the receipt of a letter from the committee, and notifying that, the civil functionaries had in consequence been requested by Government to allow the Koolkurnies at the principal Cusbas, to draw up the statistical statements required by the committee.

7. A letter from the secretary to the Medical Board, stating that, Government had sanctioned, the records of the Medical Board Office being placed at the disposal of the society.

8. A letter from R. H. Kennedy, Esq. Superintending Surgeon, requesting the acceptance by the society, of an enclosed donation of rupees (100) one hundred.

9. Case of extravasation of urine by rupture of the urethra, from calculus; by R. B. Owen, M. D.

10. A few remarks on the fever that prevailed in the 3rd Troop of Horse Artillery at Deesa, during the months of August, September, October, November, and December 1834; by R. Brown, M. D.

11. Two cases of perforation of the colon fatal by exhaustion, without peritonitis; by J. Murray, Esq.

12. Presented by the Medical Board, a series of reports for the half year, from January 1st to June 30th 1835.

Proceedings from April 15th, to May 15th, 1836.

MEMBERS ELECTED.

Corresponding.

J. A. Dunlop, Esq. Principal Collector of Dharwar.

Ordinary.

A. Gibson, Esq. Assistant Surgeon, Bombay establishment; D. Macleod, Esq. M. D. Deputy Inspector General of Hospitals, Madras; P. Stuart, Esq. Assistant Surgeon, Bombay Establishment.

COMMUNICATIONS PRESENTED.

1. A letter from J. A. Dunlop, Esq. Collector of Dharwar, informing the committee that, for a number of years past, a system had been in operation for ascertaining with tolerable accuracy, the rates of mortality in the city of Ahmedabad, and suggesting the probability that, this accumulated information might lead to useful results.

2. A letter from P. Stuart, Esq. calling the attention of the committee to the circumstance, that stations were, generally speaking, imperfectly supplied with instruments for Meteorological enquiries, and suggesting the propriety of some measures being adopted to remove this difficulty.

3. A letter from Dr. Ranken, officiating secretary to the Medical

Board of Bengal, acknowledging the receipt of a copy of the society's regulations, and expressing the hope of the Board, that unqualified success might attend the institution, and that it might be productive of as much benefit on the Western side of India, as the Medical and Physical Society of Calcutta, had been on the other.

4. A letter from Dr. Macleod, Deputy Inspector General, Madras, expressing the interest which he felt in the success of the society, and offering the assistance of his office for the furtherance of its objects.

5. A letter from the secretary to the Medical board of Madras, conveying the acknowledgements of the Board, for the copy of regulations of the society, transmitted for their acceptance, and communicating the intention of the Board to present to the society, copies of the different volumes of Medical Reports published under the inspection of the Board.

6. A case of diseased heart—hypertrophy of both ventricles, with dilatation of left, and morbid state of the aortic valves; by R. H. A. Hunter, Esq. Assistant Surgeon 2nd or Queen's Royal Regiment.

7. Geological notes on the Northern Concan, and a small portion of Guzerat and Kattywar; by Charles Lush, Esq. M. D.

8. Extract of a letter from the Acting Collector of Ahmedabad, relative to the great sickness and mortality in that Zillah, during the year 1834, 1835; presented by T. Williamson, Esq. Revenue Commissioner.

9. Forty seven Native reports of the state of health and amount of mortality in the principal Cusbas, in the Zillah of Tannah.

Proceedings from May 15th, to June 15th, 1836.

MEMBERS ELECTED.

Corresponding.

J. Graham, Esq. Bombay; J. S. Law, Esq. Civil Service, Bombay.

COMMUNICATIONS PRESENTED.

A letter from the Chief Secretary to Government, presenting to the society, in the name of the Honorable the Court of Directors, two copies of a catalogue of stars in the Southern Hemisphere; by Lieutenant Johnson, of the St. Helena Artillery.

2. A letter from the Secretary of the Medical and Physical Society of Calcutta, acknowledging the receipt of the Society's Regulations, and expressing in the name of the Calcutta society an interest in the prosperity of the institution, and a confident anticipation that a spirit of friendship and cordiality will ever unite the two bodies.

A copy of the transactions of the Medical and Physical Society of Calcutta is presented for acceptance.

3. Medical Topography of Sattara, illustrated by a sketch of its localities in the year 1828; by J. Bird, Esq.

4. Extract from Superintending Surgeon Henderson's Report, on the Jails of the Southern Deccan Division, for the year 1835; presented by the Medical Board.

5. Two cases of urinary calculi passed by the urethra; presented by James Boyd, Esquire, Civil Surgeon, Tannah.

Proceedings from June 15th, to October 1st, 1836.

MEMBERS ELECTED.

Corresponding.

Captain Shortrede, Superintendent of the Trigonometrical Survey.

Ordinary.

W. Carstairs, Esq.; J. Patch, Esq. Surgeons, Bombay Establishment; T. Brickwell, Esq.; J. A. Lawrence, Esq.; J. P. Malcolmson, Esq.; J. Ross, Esq.; T. McKenzie, Esq.; Assistant Surgeons, Bombay Establishment.

H. S. Fleming, M. D. Surgeon, Madras Establishment; W. Middlemass, Esq. Assistant Surgeon, Madras Establishment.

COMMUNICATIONS PRESENTED.

1. On the use of Colchicum Autumnale, in cases of dropsy; by J. Bird, Esq.

2. A letter from Captain Shortrede, on the prejudices of the Natives of the Deccan, in regard to civil hospitals.

3. A statement relative to the unhealthiness of some parts of Candeish, at certain seasons; presented by T. Williamson, Esq. Revenue Commissioner.

4. A Medical report on Kusba, in the district of Parkur; by James Winchester, Esq. Assistant Surgeon; presented by the Medical Board.

5. A letter from the Secretary to the Madras Medical Board, transmitting copies of General Annual Reports of the sick of the Army of the Presidency of Fort St. George, form 1827, to 1835, inclusive.

6. A singular case of Ephidrosis Partialis; by A. Duncan, Esq. Surgeon.

7. On Intermittent Fever, with practical remarks; being the half yearly report of the 12th Regiment Native Infantry, made to the Superintending Surgeon N. W. Division of Guzerat; by Willoughby Arding, M. D.

8. A case of poisoning by Arsenic, and a case of extensive Necrosis of the Radius, by J. P. Malcolmson, Esq. Assistant Surgeon, 18th Regiment Native Infantry; presented by the Medical Board.

9. A case of diseased heart, by R. H. A. Hunter, Esq. 2nd or Queen's Royal Regiment.

10. A case of sloughing, and discharge of about twenty-five inches of large intestine, in dysentery; by R. Brown, M. D.

11. Four cases of Tubercular Phthisis; by R. H. A. Hunter, Esq. 2nd or Queen's Royal Regiment.

12. A general Sketch of the province of Guzerat, from Deesa to Damaun (with a map); by A. Gibson, Esq. Vaccinator, Deccan Division.

13. Extract from the third half yearly report of diseases, in the 22nd Regiment Native Infantry; by J. Inglis, M. D. presented by the Medical Board.

14. Half yearly Report of diseases in the 1st Grenadier Regiment Native Infantry, by D. Forbes Esq.; presented by the Medical Board.

15. On organic headache, and the liability of some of its forms, to be confounded with neuralgia, and headache proceeding from other causes; by C. Morehead, M. D.

16. A case of disease arising from the absorption of the juice of the Anacardium Orientale, or marking-nut; by A. Gibson Esq. Vaccinator, Deccan Division.

17. A letter from A. Gibson, Esq. on cow-pox, as witnessed by him in cattle in Guzerat: being in reply to some queries, suggested by a statement made in Mr. Gibson's sketch of the province of Guzerat.

18. Register of the thermometer at Kaira, for May 1836; by A. Burn, M. D.

Proceedings from October 1st, 1836, to January, 1837.

MEMBERS ELECTED.

Ordinary.

R. Frith, M. D.; T. S. Cahill, M. D; J. Hamilton, M. D.; Assistant Surgeons Bombay Establishment.

COMMUNICATIONS PRESEVTED.

1. Half yearly report on the prevailing diseases admitted into the European General Hospital from January 1st, to June 30th, 1836; by J. Bird, Esq.

2. A letter from Mr. Corbyn, of Calcutta, presenting a copy of his work on cholera, and of the published volumes of the India Journal of Medical Science.

3. A case of aneurism of the aorta; by R. H. Hunter, Esq. Assistant Surgeon, 2nd or Queen's Royal Regiment.

4. A case of obstruction of the urethra by calculus in a child, three years of age; by A. Duncan, Esq.

5. A letter from A. Gibson, Esq. Vaccinator Deccan Division, forwarding some of the powdered leaves, and root of the *Aristolochia bracteata*, with a dried specimen of the plant, and recommending, that its medicinal qualities should be experimented on.

6. A letter from A. Gibson, Esq. forwarding specimens of the nut of the *Cæsalpinia bonducella*, and the bark of the *Cacalia Kleinia* (the "Gao-Zuban." of the Bazaars.)

7. Remarks on the treatment of dysentery; by T. S. Cahill, M. D.; presented by the Medical Board.

8. Report on the disease which prevailed in the neighbourhood of Kattywar, &c. in 1820; by T. Whyte, Esq.; presented by Government.

9. Report on the disease which prevailed in some of the districts in the Zillah of Ahmedabad, in 1820; by J. Gilder, Esq.; presented by Government.

10. Observations on the climate of the Mahabuleshwur Hills; by J. Murray, Esq.

11. Presented by the Medical Board of Madras, Report on Cholera; by the Medical Board, 1 Folio, 1824.

Table and reports on the diseases of Europeans..	1828.	1 vol. 8vo.
Medical reports.....	1831.	1 vol. 8vo.
Malcolmson's Essays on Beriberi and Rheumatism	1833.	1 vol.
Geddes' Reports on Fever.....	1827.	1 vol.
Medical reports from 1813 to 1818, with Septennial tables		1 vol.

12. Presented by the Medical and Physical Society of Calcutta.

Transactions of the Society	vols. 1st to 6th inclusive, 8vo.	
Ditto.....Ditto.....	vol. 7th, part 1st and 2nd.	
Selections....1833.....	1 vol.	2 copies.
Ditto.....1834.....	1 vol.	

13. Remarks on the manner of breeding leeches, practised by some natives in the neighbourhood of Seroor; by A. Gibson, Esq.

14. A few brief observations on parturition; by A. Duncan, Esq.

15. Observations on the pathology, and treatment of chronic inflammatory affections of the mucous membrane of the small intestines; by J. Murray, Esq.

16. Observations on the use of the oil of the *Sesamum orientale*, in healing wounds; by A. Burn, M. D.

17. Report on the disease which prevailed in Cutch, and Kattywar in 1836; by J. McAdam, Esq.; presented by the Medical Board.

18. A letter on the disease which prevailed in Kattywar and parts of the Zillah of Ahmedabad in 1820; by J. McAdam, Esq.; presented by the Medical Board.

19. A report on the disease which prevailed in the Western parts of

the Zillah of Ahmedabad in 1820; by J. Glen, Esq.; presented by Government.

In accordance with Regulation 4th, on the subject of the "election of office bearers," S. Fraser Esq. was elected a member of the committee of management from December 1st, in succession to Dr. McLennan, who proceeded to Egypt on sick leave.

Proceedings from January 1st, to April 1st, 1837.

MEMBERS ELECTED.

Ordinary

J. G. Moyle, Esq. 1st Member Medical Board; J. Dorward, Esq. Assistant Surgeon, Madras Establishment.

COMMUNICATIONS PRESENTED.

1. A letter from the Chief Secretary to Government, presenting a paper by A. Gibson, Esq. on various useful Native products, and a letter from the secretary of the Agricultural and Horticultural Society, on the same subject.
2. Reports and returns of the sick of His Majesty's 4th Light Dragoons, while stationed at Kaira, from the year 1822 to 1826; presented by Dr. Perston, Surgeon 4th Light Dragoons.
3. Cases of infantile disease; by A. Duncan, Esq.
4. Report on the Anatomy of Dracunculus; by D. Forbes, Esq.
5. A few practical surgical cases; by W. B. Barrington, Esq. Civil Surgeon, Broach.
6. Register of the Thermometer and Pluviometer kept at Broach, for the months of June, July, and August, 1836; by W. B. Barrington, Esq.
7. A case of protracted labour, shewing the efficacy of the ergot of rye; by J. Ferrar, Esq.
8. A letter from the Chief Secretary to Government, calling the attention of the committee, to the subject of Native Medical Education, and requesting that a full, and detailed report on it, be submitted to Government.

Proceedings from April 1st, to August 1st, 1837.

MEMBERS ELECTED.

Ordinary.

A. Graham, Esq. Surgeon; W. Deacon, Esq. Assistant Surgeon, Bombay Establishment.

COMMUNICATIONS PRESENTED.

1. A case of femoral aneurism, cured by operation; by C. F. Collier, Esq. Assistant Surgeon.

2. A case of vascular sarcoma, removed by C. F. Collier, Esq.

3. A case of delirium tremens, in which venesection at the onset was useful; by W. Deacon, Esq.

4. A few notes on the thermal springs in the Konkan; by A. Duncan, Esq. Surgeon.

5. Historical Report of His Majesty's 2nd or Queen's Royal Regiment, for the year 1836, by R. H. Hunter, Esq. Assisiant Surgeon.

6. A list of medico-topographical reports, placed at the disposal of the society, by the Medical Board, with the sanction of Government.

7. A case of spontaneous evolution, or doubling of the fœtus, which occurred after an arm presentation; by J. Waller, Esq.

8. Two cases of rapidly fatal cerebal inflammation, with very obscure symptoms, occurring in connexion with the croup-like cough, peculiar to dentition; by J. Murray, Esq.

9. A case of poisoning by the bichloride of mercury; by J. Murray, Esq.

10. A case of poisoning by arrack; by J. Murray, Esq.

11. A case of poisoning by opium; by C. Morehead, M. D.

12. A case of extensive injury of the leg from a camel bite, requiring the limb to be removed by amputation above the knee; by J. T. Ferrar, Esq.

Proceeding from the 1st September, to the 31st December, 1837.

COMMUNICATIONS PRESENTED.

1. A Translation of the Weid Jewan from the Sunskrit into Mahratta, by two Shastrees of Ahmednuggur; presented by A. Graham, Esq.

2. Notes on the state of Medical and Surgical Science on the countries bordering the Indus; by Dr. Lord, in medical charge of the Cabul mission.

3. A selection of cases of violent death, which have formed subjects of investigation before the Coroner of Bombay; by J. F. Heddle, Esq.

4. A case of Cardiac and Aortic disease; by R. H. Hunter, Esquire, 2nd or Queen's Royal Regt.

5. A few facts observed in Vaccination; by A. Duncan, Esquire.

6. Two cases of Cardiac disease; by R. H. Hunter, Esquire, 2nd or Queens Royal Regiment.

The following Gentlemen have been elected members of the committee of management for 1838.

G. SMYTTAN, ESQ. R. BROWN, ESQ.
J. BIRD, ESQ. J. F. HEDDLE, ESQ.
J. SCOTT, ESQ.

Secretary for 1838 and 1839.
C. MOREHEAD, ESQ.

List of Donations for the Library.

June 1836.

Manuel Johnson, By Government.	Copy of a Catalogue of the principal Sart of the Southern Hemisphere.

October 1836.

F. Corbyn, Esq. by the Author.	Work upon Cholera. The three published volumes of the India Journal of Medical Science.

November 1836.

By the Medical Board of Madras.	Report on Cholera, folio 1824. Tables and reports on the diseases of Europeans 1828. 1 vol. 8vo. Medical Reports, 1831. 1 vol. 8vo. Malcolmson's Essay on Beriberi and Rheumatism, 1833. 1. vol. Geddes' Reports on Fever, 1827. 1 vol. Medical Report from 1813 to 1818, with Septennial Tables. 1 vol.
By the Medical and Physical Society, of Calcutta.	Transactions of the Society, vols. 1 to 6. Ditto Ditto vol. VII, parts 1 and 2. Selections, 1833. 1 vol. 2 copies. Ditto 1834. 1 Vol.

LIST OF MEMBERS

OF THE

Medical and Physical Society of Bombay.

RESIDENT ORDINARY MEMBERS, BOMBAY MEDICAL SERVICE.

* The asterisk marks those members who are absent on furlough or sick leave.

Anderson, J. Esq. *Surgeon.*
* Arding, W., M. D. *Assist. Surg.*
Arnott, A., M. D. *Assist. Surgeon.*
Arnott, F. S., M. D. *Assist Surgeon.*
Barrington, W. B. Esq. *Assist Surg.*
* Behan, R. J. Esq. *Assist. Surgeon.*
Bell, D. C. Esq. *Surgeon*
Bird, J. Esq. *Surgeon.*
Bourchier, J. M. D. *Assist. Surgeon.*
Boyd, J. Esq. *Assist. Surgeon.*
Brickwell, T. Esq. *Assist. Surg.*
Brown, R., M. D. *Assist. Surgeon.*
Burn, A., M. D. *Assist. Surgeon.*
Butchart, J. Esq. *Surgeon.*
Cahill, T. S., M. D. *Assist. Surgeon.*
Calvert, W. Esq. *Assist. Surgeon.*
Carstairs, W. Esq. *Surgeon.*
* Collier, C. *Deputy Inspector General of Hospitals.*
Collier, C. F. Esq. *Assist Surgeon.*
Cramond, J. Esq. *Assist. Surgeon.*
Davis, G. H. Esq. *Surgeon.*
Deacon, W. R. Esq. *Assist. Surgeon.*
Doig, J., Esq. *Assist. Surgeon.*
Don, J. M. D. *Assist. Surgeon.*
Hathway, L. Esq. *Surgeon.*
Heddle, J. T. Esq. *Assist. Surgeon.*
Henderson, A. Esq. *Surgeon.*
Hunter, R. Esq. *Assist. Surgeon H. M.'s Service.*
Inglis, J., M. D. *Surgeon.*
Johnstone, H. Esq. *Surgeon.*
* Kays, M. T, M. D. *Surgeon.*
Kennedy, R. H., M. D. *Superintending Surgeon*
Kirk, R. Esq. *Assist Surgeon.*
Lord, P., M. B. *Assist. Surgeon.*
* Lush, C., M D. *Assist. Surgeon*
Mackie, W. Esq. *Surgeon in Bombay.*
McAdam, J. Esq. *Superintending Surgeon.*
* McLennan, J. Esq. *Surgeon.*
McKenzie, W. Esq. *Assist. Surgeon.*
Malcolmson, J. P. Esq. *Assist. Surg.*
Montgomery, A. Esq. *Assist. Surg.*
Morehead, C., M. D. *Assist. Surg.*
Moyle, J. G. Esq. *Medical Board.*
Murray, J. Esq. *Assist. Surgeon.*
Orton, J. Esq. *Medical Board.*

Ducat, C., M. D. *Surgeon.*
Duncan, A. Esq. *Surgeon.*
Elliot, W. R. Esq. *Assist. Surgon.*
Felix, H. M. Esq. *Assist. Surgeon.*
Ferrar, J. Esq. *Assist. Surgeon.*
Fogerty, W. K. Esq. *Surgeon in Bombay.*
Forbes, D. Esq. *Surgeon.*
* Fraser, J. Esq. *Assist. Surgeon.*
* Fraser, S. Esq. *Assist. Surgeon.*
* Frith, R. M. D. *Surgeon.*
Gibb, H. Esq. *Assit. Surgeon.*
Gibson, A. Esq. *Assist. Surgeon.*
Glen, J. Esq. *Surgeon.*
Gray, P. Esq. *Assist. Surgeon.*
Graham, A. Esq. *Surgeon.*
Graham, W. B., M. D. *Assist. Surg.*
Hadley, H., M. D. *Assist. Surgeon.*
Hamilton, J. J. Esq. *Assist. Surgeon.*
Hamilton, J. M. D. *Assist. Surgeon.*
Hamilton, A. M. D. *Surgeon H. M.'s 17th Regt.*
Hardy, W. M. D. *Assist. Surgeon.*
Harcourt, J. Esq. *Surgeon H. M.'s Service.*
* Hathorn, H. P. Esq. *Assist. Surg.*
Owen, R. B., M. D. *Assist. Surgeon.*
Patch, J. Esq. *Surgeon.*
Pitcairn, W. Esq. *Assist. Surgeon.*
Rancland, M. A. Esq. *Assist. Surg.*
Ritchie, D., M. D. *Assist. Surgeon.*
Rooke, B. P. Esq. *Assist. Surgeon.*
Ross, J. Esq. *Assist. Surgeon.*
Scott, J. Esq. *Assist. Surgeon.*
Smyttan, G. Esq. *Medical Board.*
Stewart, J., M. D. *Assist. Surgeon.*
Stuart, G. A. Esq. *Superintending Surgeon.*
Taylor, W. B. Esq. *Assist. Surgeon.*
* Walker, J., M. D. *Surgeon.*
Walker, A., M. D. *Assist. Surgeon.*
Waller, J. Esq. *Assist. Surgeon.*
Watkins, W. Esq. *Assist. Surgeon.*
Weekes, T. P. Esq. *Superintending Surgeon.*
West, A. M. D. *Asist. Surgeon.*
Wight, R. Esq. *Surgeon.*
Williams, W. R Esq. *Assit. Surg.*
Winchester, J. W. Esq. *Assist. Surgeon.*
Young, A. M. D. *Surgeon.*

NON-RESIDENT ORDINARY MEMBERS.

D. Macleod, Esq. *Inspector General of H. M. Hospitals Bengal.*
H. S. Fleming, Esq. *Surgeon Madras Establishment.*
W. Middlemas, Esq. *Assist. Surgeon Madras Establishment.*
J. Dorward, Esq. *Assist. Surgeon Madras Establishment.*

CORRESPONDING MEMBERS.

W. H. Wathen, Esq. *Chief Secretary to Government.*
T. Williamson, Esq. *Revenue Commissioner.*
J. A. Dunlop, Esq. *Collector Dharwar.*
J. Graham, Esq. *Bombay.*
J. S. Law, Esq. *B. C. S.*
Captain Shortrede, *Superintendent of the Trignometrical Survey.*

ERRATA.

Page	line		
6	7	*for* "Rapeepla"	*read* "Rajpeepla"
15	3	*for* "Hoclus"	*read* "Holcus"
86	27	*for* "Josminum"	*read* "Iasminum"
89	21	*for* "common, congestive, remittent"	*read* "common, remittent.
95 note	2	*for* "foundation"	*read* "formation"
98	18	*for* "in characterizing"	*read* "as characterizing
104 note	2	*for* "to 67°"	*read* "to be 67°"
109	7	*for* "diffusions"	*read* "diffusion"
111 note	3	*for* "maximum"	*read* "maxima"
118	7	*for* "Sausure"	*read* "Saussure"
120	19	*for* "phethora"	*read* "plethora"
—	26	*for* "which"	*read* "what"
122	3	*for* "questions"	*read* "question"
126	1	*for* "inaposition"	*read* "on a position
128	15	*for* "functions"	*read* "function"
131	1	*for* "paroxysms"	*read* "paroxysm"
133	21	*for* "digestive"	*read* "digestive function.
—	29	*for* "affections"	*read* "affection"
135	29	*for* "case"	*read* "cases"
136	4	*for* "more"	*read* "mere"
138	21	*for* "hypermia"	*read* "hyperœmia"
142	26	*for* "come"	*read* "have come"
147	27	*for* "consistent"	*read* "coexistent"
240	30	*for* "that Climate"	*read* "this climate"